

Lee
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MEDICAL SOCIETY OF THE STATE OF
PENNSYLVANIA.

SESSION OF 1877.

ADDRESS IN HYGIENE.

PROPOSED ACT

TO CREATE A STATE BOARD OF HEALTH.

REPORT OF PHILADELPHIA COUNTY MEDICAL SOCIETY.

DIAGNOSIS OF PSOAS ABSCESS.

BENJAMIN LEE, A.M., M.D.

presented by the author



PHILADELPHIA:
COLLINS, PRINTER, 705 JAYNE STREET.
1877.

*Complimented to
Benjamin Lee
1888 March 18 1877*

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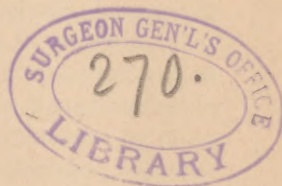
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THE ADDRESS IN HYGIENE.

IT has been greatly the fashion during the past ten years, both in England and in this country, to stigmatize the heir apparent to the British throne, the wearer of the prince's feather, as, to say the least, an altogether useless appendage to the national government. From such an opinion I humbly beg leave to dissent. I desire to express my conviction, that H. R. H. the Prince of Wales stands first among living men, not alone in his own noble realm, but in the civilized world, as a benefactor to humanity. Not as a mighty hunter, bearding the monarch of Bengalese forests in his native jungle from the safe elevation of a second story, or braving the peril of that deadly viper of Ceylon, the *tic prolunga*; not as a munificent Telemachus on his travels, bestowing largesses with princely hand on those who can well afford to return them with interest; not even as a philanthropist acting as chairman at a charity-dinner, would I urge his claim to this proud—this most enviable—distinction. I would rather ask you for a moment to contemplate him as a fever-stricken patient on his uneasy couch at Sandringham. I would call your attention to the hushed and mournful group outside the gates of the lodge, awaiting with such intense eagerness the posting of the frequent bulletin announcing that this life, which has suddenly become so dear to the nation that all its past errors are forgotten, is still spared. I would ask you to remember that this anxious assemblage is but a representation in miniature of the whole English people, hanging, by towns, by cities and by hamlets, on the hourly revelations of the telegraph: nay, that even distant continents, and, above all, this English-born and English-speaking continent of ours, throb hour by hour to the electric pulse that beats almost in unison with that of the royal sufferer—and then, when the long suspense is over, and cautious science dares to give the glad prophetic word of hope, to follow with me the steps of those sagacious physicians, who, believing their duty but

half done when they had met and vanquished the grim destroyer, by patient, pains-taking, personal investigation, assured themselves of the *causa teterrima*, the lurking poison which had worked this strange infection in the Prince's blood, and you will begin to appreciate what a powerful instrument for good this Prince has been. Sanitarians might have gone on preaching, and writing, and toiling, and striving, aye, and laying down their own lives (for noble Anstie's death stands not alone as that of a martyr to sanitary science)—all this they might have done for half a century without producing as profound an impression, without inducing as general a belief in the deadly properties of sewer gas and polluted water, as resulted from the illness of that one man. Now all England believes that typhoid fever at least may be produced by drinking water contaminated by sewage or sewage gas. Nor has the lesson been lost upon our own country. Everywhere physicians are more on the alert to protect the sound as well as to heal the sick. Everywhere earnest, intelligent, and educated investigators are applying themselves to improve the sanitary conditions of our homes, and eradicate the hidden roots of pestilence and death.

And an impulse of this kind, originating in an "*experimentum in corpore*" *nobili*, carried out in all its details to its legitimate conclusions, was greatly needed: for State Medicine, like many another tree whose leaves are for the healing of the nations, is a plant of recent growth. Sanitary legislation in England goes no further back than the Public Health Act of 1848, for although it is true that local authorities had made efforts, here and there, to improve the health conditions of their communities, and had even obtained parliamentary enactments to enable them to suppress particular nuisances, still no action had been taken looking toward a general sanitary supervision of the United Kingdom, or indicating that the government appreciated in the least degree the responsibility which rested upon it as the guardian of the life and health of its subjects.¹ As is the case with all legislation on this subject in free countries, the first law erred greatly on the side of laxity and timidity. It was permissive and suggestive rather than mandatory. The dread of trespassing on the rights of individuals led the legislators to hesitate to confer on the boards which they created, and the officers whom they commissioned, the powers necessary to enforce the reform

¹ The "Factory Health and Morals Act," 42 George III., passed in 1802, might be cited as an exception to this statement, but it was, although of general application, really local in its practical bearings, and designed to meet the crying evils existing in one or two great manufacturing towns.

measures which they urged and the necessity for which they at length became fully convinced of. This led to more positive legislation seven years later, under the title of the "Nuisances Removal Act," under the auspices of which, the health officers were enabled to sweep away many obnoxious establishments and remedy many abuses. Three years after this, the passage of the "Local Government Act," conferring increased powers on the authorities of towns and shires for the suppression of noxious industries, and the improvement of drainage, sewage, and domestic architecture, gave a new impulse to sanitary reform, bringing it more directly home to the people. An experience of the benefits to be derived from a systematic following up of the regulations suggested by the general health authorities, of careful study and investigation of the laws governing the distribution of disease in large communities and over large tracts of country, prepared the public mind for the passage in 1866 of the "Sanitary Act," by means of which a much more thorough organization of sanitary administration was effected, and the central authorities were brought into more direct relation with local bodies and individual officials. Under this act much good work was done, many important problems either solved or greatly elucidated, and as a substantial result, the annual death-rate very decidedly diminished in some parts of the kingdom—in certain large cities to a wonderful extent. Time, however, revealed defects in its practical working so serious, that further legislation was urged by those most thoroughly acquainted with the subject, and this took shape in the "Public Health Act of 1872."

Each of these separate enactments is still in force, save where it has been reinforced or superseded by the provisions of a subsequent act. It is of course greatly to be desired that they should all be collected and sifted, and, together with various minor and local laws which have accumulated under them and in pursuance of their requirements, put into a compact and solid shape, which will make them both more manageable and effective at home, and especially more useful as guides for those who are prosecuting similar labors at an earlier stage in other countries.

It will be seen then that this great body of wise and discriminating laws on this important subject, with all the laborious and pains-taking observation and investigation, all the tedious and difficult statistical calculation, all the thankless and hard-fought battles with ignorance, prejudice, greed and self-interest, and finally all the notable victories gained and immense benefits conferred—all this has been the work of a single generation, and that but just passing off the stage of life. There is certainly a world of encouragement in this fact, for all those

who have felt disheartened at the slow progress which sanitary ideas are making in the minds of our people and government.

If we turn from Old England to New England (*matris pulchræ filia pulchrior*) we shall find, in the history of the State Board of Health of Massachusetts, a source of even greater consolation. Its brief existence of seven years has been an uninterrupted succession of triumphs in favor of the health, happiness, and prolonged life of the inhabitants of that State. To such an extent is this true, that a learned jurist and careful statistician, a member of the legislature of that State, has pronounced the opinion, based upon careful calculations, that in single villages the saving in money—not in life, not in health, not in happiness, or any such mere sentimental advantages, but in actual cash—in consequence of the existence and action of this board, amounted to more in a single year than all the expenditures of the board for the entire State. We may not unprofitably take a hurried glance at their work, especially as the circumstances surrounding them, forms of State and local government, and characteristics of population, have many points in common with our own, making the problems which they have successfully solved much the same in form as well as in fact that our sanitary authorities will find themselves compelled to grapple with.

The act establishing a State Board of Health in Massachusetts was passed June 21, 1869, and went into effect immediately. All of the liberal professions, with commerce, science, and literature, have been represented in its membership. There has been nothing one-sided, partisan, or bigoted, either in its constitution or its action. It began its work by sending out a circular explanatory of the then existing condition of the health laws of the State, what they authorized, what they prevented, and what amount of actual power they conferred on health officers. And now mark the wisdom which characterized the distribution of this circular. It was sent not only to mayors of cities, not only to members of the legislature, not only to physicians, but to every selectman of every town, and every clergyman throughout the commonwealth. In this way public enlightenment at once commenced, and a public sentiment was created which sustained and even stimulated the reformatory zeal of the local authorities. The Declaration of Independence, which may almost be considered as a part of the constitutional law of the United States, guarantees to every individual certain inalienable rights—life, liberty, and the pursuit of happiness. The Board rightly argued that among these was included the inherent right of every citizen "to the enjoyment of pure and uncontaminated air, and water, and soil," and that it is the duty of the State to see that

no one should be allowed to trespass on this right, whether from negligence, from greed of gain, or even from ignorance. The abridgment of the rights or license of the individual for the sake of protecting the rights of the community is the very foundation stone of civilized life. Civil organization cannot exist without it. The people recognize this fact in reference to *certain* agencies which are dangerous to life and health, but strangely ignore it in reference to other agencies which are infinitely more destructive. Thus we prohibit the merchant from exercising his right of barter and sale and storage in the matter of explosives. He is not allowed to keep any considerable quantity of gunpowder or nitro-glycerine within certain limits, or within a certain distance from an inhabited house. This is right and proper. But if a powder magazine had exploded in every street of Philadelphia on the first day of January, 1872, this calamity, frightful as it would have been, would not have caused as many deaths, would not have produced as much suffering, would not have inflicted as great pecuniary loss, as did the great epidemic of variola which was then raging. Thousands of lives, tens of thousands of maimed, disfigured, or invalided persons, millions of money; such was the cost of this explosion. A single pustule of smallpox virus, contains more powerful elements of destruction than a fifty pound can of nitro-glycerine; yet the one a man may retain in his house without the slightest remonstrance from the law, while the whole neighborhood would be up in arms against him for keeping the other, and the authorities would at once compel its removal. *

A few years since, a flood of fire poured through the streets of a section of the city of Philadelphia. Men were headed off by rivers of liquid flame, and perished in frightful agony in full sight of their fellows, powerless to rescue them—home after home melted and crisped and tottered to ruin before the blazing torrent spent itself. Public sentiment was greatly outraged, as well it might be, that so dangerous an industry as the refining and storing of petroleum should have been permitted in the heart of a populous city, and legislation was quickly invoked to banish it to the rural districts. But the citizens of Philadelphia are daily pouring down their throats a fluid which, in the course of a single month, burns up in the horrid torture of fever more victims from among them than the Southwark fire destroyed, and yet men go on pursuing industries which pollute the purity of the city's water-supply, and the law is powerless to remove those industries. Why is public opinion so thoroughly aroused on the one question, so completely dormant on the other? Simply because in the one case it is instructed,

in the other it is ignorant. It can trace the connection between a shattered corpse and an exploded powder keg; it is beginning dimly to do so between a bloated corpse and an empty whiskey bottle; but it utterly fails to do so between an emaciated fever smitten corpse and a glass of cold water. Hence the absolute necessity, if we would have efficient administration of sanitary laws, for the instruction of the people in the simplest of the principles of hygiene. We must create a sound and sensitive public sentiment in favor of the preservation and protection of the public health. And, at this foundation-stone the Massachusetts Board began its labors.

But the Board was itself in need of instruction as to the sanitary conditions of the various centres of population throughout its jurisdiction. This it sought by issuing a circular to the selectmen or health officers of every town, requesting that some trustworthy physician should be recommended for appointment by the Board as its medical correspondent in that town. From the returns of these correspondents the Board was enabled at once to ascertain the existence, character and proportions of any epidemic that might occur. Preliminary measures having thus been satisfactorily taken, the Board felt itself to be sufficiently well understood and supported by the public to enable it to attack specific evils.

It first measured its strength with the fifty slaughter houses in the Brighton suburb of Boston, which, with their adjuncts, bone-boiling, fat-trying, refuse-rendering, etc., contaminated the air for miles around with foul odors and pernicious vapors. The butchers of course made a strong fight, but persistence, wise management, and education carried the day; so that at the end of six years the Board was able to congratulate the citizens that this task was ended, and "a whole town rendered an agreeable and salubrious place of residence; while, at the same time, it had within its limits, though somewhat remote from its residences, an admirably conducted abattoir, which need never be a source of offence, and which was capable of supplying with meat all the inhabitants of the metropolitan district." And the best of it is that none are more pleased with the new arrangement than the butchers themselves. The battle having thus been won by the State Board, the duty of maintaining the conquered rights was intrusted to the local authorities, and the care of the abattoir transferred by legislative enactment to the City Board of Health.

Similar action was successfully taken in regard to nuisances of this kind in other suburbs and towns, and "such excellent results followed the frequent visits of inspection to the large slaughtering

establishments, that the Board recommended to the Legislature, in their sixth and seventh annual reports, that some provisions should be made by law providing for a regular inspection of all such works hereafter." The sanitary condition of the homes of the poor early attracted their attention, and in spite of "the utter indifference to the subject in the public mind," and the unwillingness of politicians to inaugurate any movement, which owing to ignorance or prejudice would incur opposition and risk their tenure of office, they at length succeeded in obtaining a charter for a company, "whose object should be the building and hiring of suitable tenements for the poor." When it was found impossible to induce city councils to undertake needed reforms, the Board carried its cause directly to the source of power, the citizens in mass-meeting assembled, and were invariably sustained by the ballot. Each annual report has contained papers of great value, founded on original investigations by physicians appointed for the purpose, of subjects connected with the causation and prevention of disease, such as milk-, water- and food-supplies, *trichiniasis*, foot and mouth disease, river pollution, wall-paper poisoning, sewage disposal, alcoholic beverages, ventilation of school-houses, and so on. Ten thousand eight hundred of these reports are now printed for distribution each year, and in addition to this, large editions of elementary instructive papers have been sown broadcast among the people. "Such has been the written history in the barest abstract of the State Board of Health of Massachusetts. Its unrecorded work can, of course, never be given to the public. It would be impossible to estimate the actual amount of public sanitary work which has, oftentimes unconsciously, owed its origin" to its wise counsels. "In many cases hotly disputed questions of local importance have been quietly settled, and oftentimes even a threatened litigation has been avoided by an appeal to the Board, whose unbiased opinion has always been freely given when asked for." We see then that its work has been mainly one of instruction. It has thrown out its feelers into every remotest nook and hamlet of the State. It has found out who could be relied on as intelligent agents, to keep it informed as to the sanitary condition of the inhabitants, and at the same time to diffuse among them such simple and practical information as they could both readily appreciate and easily apply. It has made use of every ordinary channel for the conveyance of knowledge to the public; the secular as well as the medical press, the clergyman as well as the physician, the forum and pulpit as well as the medical society. It has taken pains that the intelligence which it communicated should be at first hand—should possess the freshness, the sparkle, the enthu-

siasm, the reliability and the innate force, of personal observation made upon the spot, dealing with facts which all to whom they came could verify. And in this way it has commanded a respectful hearing for itself, and that hearing has brought conviction.

It has carefully avoided conflict with local health authorities when that was possible; and when the honesty and purity of its intentions became manifest, that generally was possible. Work that it has begun and carried to a successful issue, it has turned over, so soon as they would undertake to carry it on in good faith, to the local authorities to perpetuate. It is always ready to counsel, never hasty to interfere. And to-day, throughout the whole Commonwealth, there is entire accord between the health boards, committees, and officers of every town and city, and the general board.

I do not know how I could have presented to you in any more forcible way the subject which I desired to illustrate in this paper, namely, the "End and Scope of a State Board of Health," than in this simple recital of the progress of sanitary legislation in the two most highly civilized populations of the old and the new world. Their evils are our evils, their difficulties will be our difficulties, and in the light of their experience we must meet them. It will not be out of place, however, to refer to a few of the great problems which a general sanitary establishment, sustained by the weight of the State Government, can alone successfully cope with and which must early engage its attention.

The first question which I would allude to in this view of the matter, is the harmonizing of the sanitary interests of different but contiguous or otherwise related sections. It often happens that the sanitary undertakings of one city prove to be most inauspicious in their results in regard to another city. The towns and cities which line the Schuylkill, for example, each most unthinkingly washes itself in that limpid stream, and so far as it alone is concerned, does well; but unhappy Philadelphia, with the typhoid virus creeping through her veins with ever-increasing malignity, shudders as she unwillingly drinks their polluted washings. Hence the necessity for the consideration in a broad, generous spirit of the difficult problem of the "pollution of rivers," and the determination of methods whereby one community may improve its own health conditions without impairing those of a neighbor. An admirable paper will be found in the Transactions of the American Public Health Association for 1874, by General Egbert L. Viele, showing how tens of thousands of dollars have been squandered in a comparatively small district of the State of New Jersey, drained by the Passaic and Hackensack Rivers, and thickly set with large towns, in the almost

vain attempt to dispose in some satisfactory way of their sewage, from the fact that there has been no intelligent concert of action among different centres of population, and hence the efforts of one have been often completely thwarted by the operations of another in the same praiseworthy direction.

Next, in an immense territory like our own, larger than that of many a nation of Europe, with its great diversity of surface and lofty mountain ranges, the question of drainage becomes one of paramount importance—in what directions the water shed shall be encouraged and in what diverted, and to what extent private corporations are to be allowed to jeopardize the health of large sections of the country by obstructing watercourses for the purposes of manufacture or navigation. Much interesting matter on this point is to be found in the reports of county societies, scattered through the volumes of the Transactions of this Society. The history of the so-called "*Drowned Lands*" in Orange County, New York, and Sussex County, New Jersey, as given by Prof. Cook, State Geologist, of New Jersey, before the Am. Pub. Health Association at its Baltimore Meeting, is also full of interest in this connection.

The fact that so large a portion of our State is still in a wild, uncultivated condition, gives great opportunities for sanitary engineering on a large scale, and for preventing in this way the evils which so often follow in the train of a blind and disconnected occupation and cultivation of a territory. Especially in the matter of protection of forests is interference needed here. A wise discrimination may be used in determining what forests act as natural barricades against the force of devastating winds, and should, therefore, be untouched, and what ones interfere with the proper circulation of the atmosphere, and may, therefore, with safety be removed. The agency of forests in maintaining a permanent average rainfall throughout the year and thus preventing both drought and destructive floods, cannot be gainsaid, and merits careful attention. But especially with a growing population is an opportunity offered for an immense amount of prospective sanitation to be accomplished in supervising the laying out of new towns. No town should be allowed to take the simplest corporate form, without laying before the health authorities of the State a carefully prepared plan of its hygienic provisions. Inquiry should be made into the character of the soil on which it is proposed to found it, the quality and quantity of its water supply, the width of its streets, its projected sewage, whether its lines of sewage are easy and take advantage of natural watercourses, and are adapted also to assist in the drainage of the natural surface water, its regulations in regard to habitations, as

to space allowed to each, and space allowed in each, to height of rooms and to ventilation. All these are points which should not, in our day, be left to settle themselves haphazard as emergencies arise, or as the streets of New York were originally laid out by the meanderings of meditative cows going to and from their pasture, but should, by a wise provision, be arranged beforehand, and evils thus be easily and wholly averted, which when once they have become established, prove so difficult of remedy. The relations of the country to the city as a purveyor must also be considered. The supply of fresh vegetables and pure milk to large communities is of the utmost importance, and should be infallibly insured. The transportation of live stock for food requires to be very carefully watched and regulated, both that none but healthy and therefore wholesome meat may be exposed for sale, and that infectious and epidemic diseases may not be introduced among our native stock from other localities.

Thus it will be seen, even from this hasty and bald summary, that, entirely apart from its function as an adviser and confidant of established local health boards and officers, an immense amount of independent and heretofore neglected work is waiting to be entered upon by a State Board of Health, work of the utmost importance for the future as well as the present well-being of our Commonwealth.

In view of the fact that a bill for the establishment of such a board has been twice debated in our Legislature (although at the last session it passed the Senate), I have ventured to draw up an act, which may avoid some of the failures which rendered the others objectionable, and which, with the weighty endorsement of this Society, would, I trust, have a fair chance of success.

Extract from the Minutes.

“Resolved, That this Society gives its official endorsement to the proposed bill introduced at the close of the Address in Hygiene, for the creation of a State Board of Health in this Commonwealth.

“Resolved, That the Committee on State Board of Health be instructed to present it through the appropriate committee to the Legislature at its next session.”

AN ACT

To create a State Board of Health, to provide for the registration of vital statistics, and to assign certain duties to local boards of health and health officers in this Commonwealth.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same,* That the Governor, with the advice and consent of the Senate, shall, as soon as possible after the passage of this act, appoint six persons, five of whom shall be physicians, in the State, of good standing and of not less than ten years' professional experience, and one of whom shall be a civil engineer of not less than ten years' professional experience, who, together with the Secretary of Internal Affairs, the Superintendent of Public Instruction, and the President of the Board of Health of the City of Philadelphia, shall constitute a board of health for the State, which board shall be denominated the "State Board of Health of Pennsylvania." Of the six persons first appointed, two shall serve for two years, two for four years, and two for six years from the first day of July next following their confirmation, and the Governor shall hereafter biennially appoint, by and with the advice and consent of the Senate, two persons of the same professions as those whose terms of service have just expired, to be members of said State Board of Health, to hold their offices for six years from the first day of July next following their confirmation and until their successors are appointed, excepting the secretary, who shall continue in office as hereinafter provided; but any member may be reappointed. Any vacancy occurring in said board during a recess of the Legislature shall be filled by the Governor until the next regular session of the same.

SECTION 2. As soon as possible after the appointment of the first six persons as aforesaid, they shall meet (on the call of the Secretary of Internal Affairs) in the office of the Secretary of the Commonwealth, and shall proceed under the direction of the latter officer to determine by lot which of them shall serve for the respective terms of two, four, and six years. Immediately before entering upon the duties of the office they shall, together with the President of the Board of Health of the City of Philadelphia, take the oath pre-

scribed for State officers by the Constitution of the State, and shall file the same in the office of the Secretary of the Commonwealth, who, upon receiving the said oath of office, shall issue to each a certificate of appointment for his respective term of office determined as aforesaid, upon receiving which they shall possess and exercise the powers and perform the duties of said board as defined in this act. Immediately after having taken the oath of office, they shall meet with the Secretary of Internal Affairs and the Superintendent of Public Instruction, and organize by electing one of said board, not already an officer of the State, to be president, and by appointing a proper person, who shall be a physician of good standing, and of not less than ten years' professional experience, to be secretary of said board. The president shall be elected annually. The secretary shall hold his appointment until removed by the appointment of a successor or otherwise, and shall be executive officer of said board, and shall receive an annual salary not to exceed three thousand dollars, which shall be paid him in the same manner that the salaries of other State officers are paid; and such necessary expenses as the Auditor General shall audit, on the presentation of an itemized account with vouchers annexed and the certificate of the board, shall be allowed him. No member of the board except the secretary shall, as such, receive any salary, but the actual travelling and other expenses of any member, while engaged in the duties of the board, shall be allowed and paid, on presentation of an itemized account as aforesaid. The board may elect one of its own members secretary, in which case the vacancy thus created shall be filled by the Governor in the same manner as a vacancy caused in any other way.

SECTION 3. The secretary shall keep a record of the transactions of the board; shall have the custody of all books, papers, documents, and other property belonging to the board, which may be deposited in his office; shall, so far as practicable, communicate with other State boards of health, and with the local boards of health within this State; shall keep and file all reports received from such boards, and all correspondence of the office appertaining to the business of the board. He shall, so far as possible, aid in obtaining contributions to the library and museum of the board. He shall prepare blank forms of returns, and such instructions as may be necessary, and forward them to the clerks of the several boards of health throughout the State. He shall collect information concerning vital statistics, knowledge respecting diseases, and all useful information on the subject of hygiene, and through an annual report, and otherwise, as the board may direct, shall disseminate such information among the people.

SECTION 4. The said board shall meet at least every three months, and may also hold special meetings as frequently as the proper and efficient discharge of its duties shall require the same to be held, in the Capitol at Harrisburg (unless otherwise ordered), and the rules or by-laws shall provide for the giving of proper and timely notice of all such meetings to every member of the board. The Secretary of Internal Affairs shall provide and furnish such apartments and stationery as said board of health shall require in the discharge of its duties. A majority of the members of said board shall at any regular called or adjourned meeting organize and constitute a quorum for the transaction of business.

SECTION 5. The State Board of Health shall have the general supervision of the interests of the health and life of the citizens of this State. They shall especially study the vital statistics of this State, and endeavor to make intelligent and profitable use of the collected records of deaths and of sickness among the people; they shall make sanitary investigations and inquiries respecting the causes of disease, and especially of epidemics; the causes of mortality, and the effects of localities, employments, conditions, ingesta, habits, and circumstances on the health of the people. They shall, when required by the governor or the legislature, and at such other times as they deem it best, institute inspections of public institutions throughout the State, and advise officers of the State, county, or local government, in regard to the location, drainage, water supply, disposal of excreta, heating and ventilation of such public institutions or buildings. They shall from time to time recommend standard works on the subject of hygiene for the use of the schools of the State.

SECTION 6. It shall be the duty of the State Board of Health to have the general supervision of the State system of registration of births, marriages, and deaths, to prepare the necessary methods and forms for obtaining and preserving such records, and to insure the faithful registration of the same in the several counties and in the central bureau of vital statistics at the capitol of the State. The said Board of Health shall recommend such forms and amendments of law as shall be deemed to be necessary for the thorough organization and efficiency of the registration of vital statistics throughout the State. The Secretary of said Board of Health shall be the superintendent of registration of vital statistics. As supervised by the said Board, the clerical duties and safe-keeping of the bureau of vital statistics thus created shall be provided for by the Secretary of Internal Affairs, who shall also provide and furnish such apartments and stationery as said Board shall require in the discharge of such duties at the capital of the State.

SECTION 7. It shall be the duty of all health officers and boards of health in the State to communicate to said State Board of Health copies of all their reports and publications, also such sanitary information as may be useful, and said Board shall promptly cause all proper information in its possession to be sent to the local health authorities of any city, village, or town in the State which may request the same, and shall add thereto such useful suggestions as the experience of said Board may supply. And said Board is authorized to require reports and information (at such times, and of such facts, and generally of such nature and extent, relating to the safety of life and promotion of health, as its by-laws or rules may provide) from all public dispensaries, hospitals, asylums, infirmaries, prisons and schools, and from the managers, principals and officers thereof, and from all other public institutions, their officers and managers, and from the proprietors, managers, lessees and occupants of all places of public resort in the State; but such reports and information shall only be required concerning matters or particulars in respect of which it may in its opinion need information for the proper discharge of its duties. Said Board shall, when requested by public authorities, or when they deem it best, advise officers of the State, county, or local government in regard to sanitary drainage, and the location, drainage, ventilation, and sanitary provisions of any public institution, building, or public place.

SECTION 8. It shall be the duty of the State Board to give all information that may be reasonably requested concerning any threatened danger to the public health to the health officer of the port of Philadelphia, quarantine physician and all other sanitary authorities in the State, who shall give the like information to said Board; and said Board and said officer, said quarantine physician and said sanitary authorities, shall so far as legal and practicable cooperate together to prevent the spread of disease and for the protection of life and the promotion of health within the sphere of their respective duties.

SECTION 9. Said Board may from time to time engage suitable persons to render sanitary service and to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto; and it is hereby made the duty of all boards, officers and agents having the control, charge or custody of any public structure, work, ground or erection, or of any plan, description, outlines, drawings or charts thereof, or relating thereto, made, kept, or controlled under any public authority, to permit and facilitate the examination and inspection, and the making of copies of the same by any officer or person by said Board

authorized; and the members of said Board and such other officer or person as may at any time be by said Board authorized, may, without fee or hindrance, enter, examine, and survey all grounds, erections, vehicles, structures, apartments, buildings and places; but no more than five thousand dollars in any one year shall be expended for such special sanitary service.

SECTION 10. It shall be the duty of said Board, on or before the first Monday of December in each year, to make a report in writing to the Governor of this State upon the sanitary condition and prospects of the State, and such report shall set forth the action of the said Board and of its officers and agents and the names thereof for the past year, and may contain other useful information, and shall suggest any further legislative action or precaution deemed proper for the better protection of life and health, and the annual report of said Board shall also contain a detailed statement of the State Treasurer of all money paid out by or on account of said Board, and a detailed statement of the manner of its expenditure during the year last past, but its total expenditures shall not exceed the sum of eight thousand dollars in any one year.

SECTION 11. The sum of eight thousand dollars (\$8000) is hereby appropriated from the treasury for the purposes of this act, and the expenditures properly incurred by the authority of said Board and verified by affidavit, subject, however, to the limitations hereinbefore imposed, and shall be paid by the treasurer upon the warrant of the Auditor General.

SECTION 12. This act shall take effect immediately, and all acts or parts of acts inconsistent herewith shall be and are hereby repealed.

REPORT OF THE COMMITTEE ON METEOROLOGY AND EPIDEMICS OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY.

THE METEOROLOGY of the year 1876 was exceptional. The elements appeared to vie with each other in making the Centennial year of American national existence memorable in its natural phenomena as well as in its historic associations. Unseasonable mildness followed by gales of terrific violence, heat unparalleled in duration and degree balanced by cold both protracted and severe, constituted a sequence as remarkable from a scientific point of view as it was prejudicial to health and promotive of a high rate of mortality. The December previous had been normal in temperature, but characterized by dampness and fog. The new year opened with the same peculiarities; but, as it progressed, the atmosphere became dryer, the sky clearer and the temperature higher, so that the month of *January* showed the very unusual monthly mean of 40.64° Fahr., 11.19° higher than that of *January*, 1875, and about 4° above the norm. The rainfall was very slight, amounting only to 1.63 inches, there having been but nine days on which rain or snow fell. This unusual continuance of fair and mild weather in mid-winter was noticeable as affording an opportunity, quite uninterrupted, of prosecuting work on the buildings and grounds of the International Exhibition, and it was owing to this that the preparations were in such a state of forwardness when the opening day arrived. Although several considerable falls of temperature and storms of tremendous violence, one at the beginning and one at the middle of the month, took place in *February*, the monthly mean temperature was still high— 37.21° , as compared with 29.57° in the previous year. In reference to the cause of this abnormally high thermometer, the Chief Signal Officer of the U. S. says in his Annual Report for 1876, "In general, it would seem, that during the present winter extensive areas of cold air have pressed outward from the northern and interior portions of the eastern and western continents, but owing to preponderating extent and influence of the former continent, the air over the Atlantic has been pushed westward, so that there has

been a tendency towards higher pressures and moister, warmer air in the Southern and Atlantic States."

March was more nearly normal in its meteorology than the two preceding months; cold and blustering, lying alike to the temper and the health; dust-storms alternating with pelting rains, heavy snows, and northeasterly gales, a temperature a fraction below that of January; nothing, in short, to be said in its favor so far as its immediate effect on health and comfort was concerned. Its rainfall was great, and, added to that of February, amounted to eleven inches.

During all these three months there were but seventeen days on which the mean temperature was below 32°, five in January, eight in February, and four in March, while the year before there were no less than forty-two such days during the corresponding period.

April, May, and June were clear, dry, and delightful; although by the latter part of the last-named month a tendency to a steadily maintained high thermometer began to manifest itself, a foreshadowing of what the Centennial summer was to be. The mean temperature was above 51° in ten days during this month, and its monthly mean was 78.30°. And now followed a period of scorching, withering, wilting, deadly heat, which, as it had no parallel in this portion of the habitable globe in the experience of living man, so will it remain forever branded into the memory of every one who endured its tortures. It was memorable alike for its intensity, the whole extent of the earth's surface involved, and its long duration. On this continent, from Maine to Texas, from the Atlantic to the Pacific, the dog-star reigned. For weeks together the mercury ranged above 90°, not rarely touching 100°, and on the 8th day of July reached 102°, the highest point attained for twenty-five years. The mean temperature of this day was 93½°.

In Europe, although the thermometer did not stand as high as here, the unusual character of the summer was not less marked. Numerous cases of constroke took place in the streets of London. A senator of France was prostrated by the heat in the legislative halls. Forty laborers died from the effects of heat in Seville. The streets of Madrid were absolutely empty during the heat of the day. Berlin, and many other European capitals, were visited by a similar wave of caloric. One singular evidence of the protracted high temperature of the summer was the intense vitality and rapid increase of insect life, especially of a parasitic character. Domestic animals, particularly dogs, were inflated with heat to a most harassing extent, and no amount of washing sufficed to free them of these torments. Careful housewives were driven to distraction by

the hosts of *cimices lectularii*, which, appearing out of every crack and crevice, swarmed in frightful numbers over their snowy sheets, driving sleep from the pillow, and defying all efforts at their extermination. Flour and meal "bred worms" to an unprecedented extent. Biscuit and crackers were infested with the weevil. The specimens of grains, plants, and seeds which were sent to the International Exhibition from other countries developed animal life to such a degree that a committee of entomologists were appointed by the Academy of Natural Sciences to inquire into the character and number of the insects so introduced. These facts are mentioned as having a possible bearing on one theory of "causation of epidemics."

No attempt has been made to account for this remarkable disturbance of temperature equilibrium, but it is evident that the cause must have been one of very general operation, and, probably, extraneous to our atmosphere. It is at least a significant fact, in this connection that, as reported in "Nature" for June 22, 1876, "According to the photographs taken daily at Montmartre by M. Janssen, no spots had been noticed on the sun up to that date since March 25th."

Not until late in the month of August was there any decided and continuous relief from this fierce outpouring of the solar rays. There were altogether forty-five days whose mean temperature was above 81° , the last one being the first day of September.

The early summer was comparatively dry, but during August heavy falls of rain took place, amounting in the course of the month to 8.69 inches, considerably more than for any other month in the year, and nearly one-fifth of the entire annual rainfall. The autumn months presented no unusual features, but *December* ushered in a period of severe and protracted cold. The mean temperature of the month was 28.70° , and ranged below the freezing point on twenty-one days. There were several storms of rain and sleet, but little snow, so that the earth in the country and the streets in the city were glazed with ice for weeks together. Notwithstanding this great reduction of temperature at the close of the year the annual means was 1.67° above the average for twenty-five years. The rainfall, force of vapor, and relative humidity, were all somewhat less than usual for the year. To determine what effect these remarkable meteorological conditions had upon the health of the city, we turn now to Mortuary Tables Nos. 1 and 2, in which we have recorded the number of deaths assignable to certain of the more important diseases, such especially as are liable to be affected by atmospheric fluctuations in temperature and moisture, as well as the total number of deaths occurring in each month.

MORTUARY TABLE NO. 1.

Deaths for each month in 1875 and 1876.

	1875	1876
January	1,344	1,401
February	1,392	1,373
March	1,843	1,918
April	1,377	1,336
May	1,398	1,662
June	1,188	1,441
July	1,744	2,523
August	1,120	1,525
September	1,175	1,663
October	1,341	1,565
November	1,092	1,242
December	1,339	1,242
Total	17,895	18,892

But in order to compare the mortality of this year intelligently with that of former years, we must first determine the population of the city. The census taken under the direction of Mayor Stokley in April gave a population of 817,448. This included, of course, the large number of persons brought to Philadelphia in connection with the preparations for the International Exhibition, but was exclusive of the host of visitors who poured into the city all through the six subsequent months, and who contributed their quota, although a small one in proportion to their numbers, to its mortality. The number of individual visitors your committee estimate at about two and a half million. But it must be remembered that a considerable proportion of these lived within a few hours of the city, and did not even pass the night here, while even those whose homes were distant, if they found themselves threatened with serious illness, would, in the majority of cases, at once start on their homeward journey, and thus would not add to the death list of the city if the attack proved fatal. Your committee cannot but think that the population of 900,000 assumed by the medical director of the Exhibition (whose circulars will be found in the appendix) as a basis for estimating the comparative mortality of this and the other great cities of the world, is an exaggeration. Our normal rate of growth would have entitled us to an estimate of 825,000 up to the middle of the year, and if we allow 25,000 more on account of temporary residents, we shall be claiming all that we have a right to on this score. We assume then for the year an average population of 850,000. This is nearly 50,000 more than the population assumed for 1875, an increase of

one-sixteenth or six and a quarter per cent. Had the same general conditions then prevailed as in the previous year, our mortality should have been that of 1875 increased by this ratio, which would have made it 18,932. In point of fact, it was 18,892, or 40 less, while the atmospheric conditions were incomparably worse. The death-rate of the city for a considerable number of years has averaged 22.68 per 1000, or 44.15 persons living to one death. That of 1876 was 22.21 per 1000, or 45.02 persons living to one death. The actual mortality of our neighboring city of New York for the same year was 29,152, a death-rate of 27.23 per thousand, or 36.72 persons living to one death. In comparing the two years month by month, we find that the actual mortality was less in 1876 than in 1875, in five months, viz., February, April, June, August, and December; that it was less than the allowable increase of six and a quarter per cent. in two months, viz., January and March; and that it exceeded the allowable increase in five months, viz., May, July, September, October, and November. It is not until May, therefore, that we notice any departure from our customary low rate of mortality. That of March was high as it always is, the highest excepting that of July, claiming 1918 victims, of whom about 800 were sacrificed to phthisis pulmonalis and acute pulmonary affections. This we always look for. But how shall we account for the excess of May? Your committee are inclined to attribute it to the intense excitement attendant upon the opening of the Exhibition and the immediate influx of visitors and increase of population.

MORTUARY TABLE No. 2.

Deaths from certain of the more important diseases, occurring in each month in 1876.

	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
Total deaths.....	1492	1373	1918	1336	1662	1441	2024	1525	1663	1565	1242	1242	18,892
Scarlet fever.....	55	45	66	38	28	20	17	8	5	17	15	18	328
Typhoid fever.....	36	37	45	34	51	44	50	100	104	24	61	101	761
Smallpox.....	26	33	47	45	49	47	28	19	19	28	44	28	407
Old age.....	11	42	81	32	67	28	53	39	51	50	54	49	599
Debility.....	39	43	60	40	63	48	100	62	64	71	52	36	682
Monstrous.....	2	2	2	5	11	15	9	5	3	.....	1	.....	54
Diphtheria.....	52	56	81	57	73	62	24	32	47	63	43	68	708
Croup.....	42	57	42	29	32	23	8	17	24	42	39	31	386
Cholera infantum.....	4	4	3	6	21	188	601	197	131	12	5	1	1,173
Phthisis pulmonalis.....	219	218	328	216	252	195	185	173	229	247	219	223	2,676
Inflammation of lungs.....	114	134	208	110	116	41	40	37	55	80	72	74	1,081
Inflammation of bronchi.....	52	40	47	16	36	18	16	12	20	29	34	34	444
Sunstroke.....	.....	.....	.....	.....	.....	.....	127	.....	.....	.....	.....	.....	127

Stillbirths 896

Premature births 244

In *June* the excitement having somewhat abated, the death-rate fell off considerably, notwithstanding that it was swollen by nearly

two hundred deaths from cholera infantum, the weather now becoming continuously warm. The period of fearful heat which followed, while it diminished the fatality of consumption by one-half as compared with March, and of pneumonia by four-fifths, made ample amends by its tax upon infancy and old age. Six hundred and one deaths took place from cholera infantum in July, and one hundred and twenty-seven from sunstroke. One hundred deaths are attributed to debility. The total mortality for the month reaches the lofty figure of 2529. With the diminishing heat of the latter half of August, cholera infantum began to subside, falling to 197; but evidence of the continuance of high temperature in September is furnished by the fact that 131 deaths are attributed to this disease in that month. The entire number of infants who perished from it during the season was 1173, a larger number than ever before occurred with one exception, that of 1872, also a year of excessive and protracted heat.

The closeness with which the mortality from this disease follows fluctuations of temperature, and the certainty with which it makes its appearance as soon as the requisite degree of heat is persistently maintained, seem to point this out as the sole essential factor in its production, and to indicate that the initial lesion is not in the alimentary canal, the result of improper alimentation, but in the nervous system. If this be so, it is evident that our therapeutic efforts should be addressed not to checking intestinal fire or multiplying mucous secretion, but to diminishing bodily temperature, restoring tone to the brain and spinal cord, and acting secondarily on the alimentary canal through the medium of the vaso-motor nerves.

It is an eloquent commentary on the abundance and wholesomeness of the food supply of the city, that even with the immense and sudden increase of consumers, diarrhœa, dysentery, and cholera-morbus, usually aggravated by continued high temperature, prevailed to a less extent than the year before, and to a very slight extent as compared with their prevalence in other cities. Mild cases of intestinal disturbance were of course frequent, but these three diseases together are accountable for a mortality of only 262 for the entire year, and of these deaths 102 were among children below 5 years of age, only 80 occurring in individuals between the ages of twenty and sixty, while 70 took place above the latter age. This weighing out of the extremes of life shows clearly that the heat was responsible for the greater part of these affections.

Of the excess of the mortality of this year over the previous one, amounting to 1087, nearly one-half occurred in early infancy, during the first twelve months of existence, and one-tenth, or 107, are set

down to old age. With the return of cold weather, phthisis began again to assert its lethal pre-eminence, having by the end of the year accomplished a death-roll of 2676, an increase of 317 over the previous year, and by far the largest ever reached in this city. Acute diseases of the air-passages did not again reach the level of the opening of the year, the latter part of the winter being the time of their greatest prevalence.

We have thus accounted for the increased mortality of the year satisfactorily by a consideration of those affections which are peculiarly under the influence of meteorological forces and without reference to that important class of diseases which may prevail as—

EPIDEMICS.—Here we shall find that our gains and losses very nearly balance one another. We are at once enabled to strike off a grand total of 704 for SCARLET FEVER. This disease began to lose its malignancy as the warm season came on, and by September had almost disappeared, the deaths for that month having been but five, nor did it again assume a threatening aspect.

DIPHTHERIA shows an increase over the already alarming figure of the year before of 52, but this increase is more apparent than real, for its *alter ego*, CROUP, shows a corresponding decrease of 42; and as these affections are very similarly affected by atmospheric conditions, and were both prevalent in an epidemic degree, the inference is not strained that the difference was one of nomenclature rather than of pathology, indicating a growing conviction on the part of the profession that croupal affections are essentially diphtheritic. These two diseases combined were the cause of death in 1094 cases, of whom only 21 were adults. The number of fatal cases in January was 124; it fell to 32 in July, and, with returning cold weather, gradually rose again to 99 in December.

It is mortifying to be compelled to record that, notwithstanding the fearful lesson of the epidemic of 1871-72, notwithstanding the warning of the previous year in a slowly but steadily increasing mortality in our own city, notwithstanding the knowledge of the prevalence of the disease as an epidemic in various parts of Europe, so lax are our sanitary laws, so powerless are our health authorities that this disease has again stolen a march on them, and intrenched itself firmly within our walls. A death-roll of 407 from this loathsome but entirely unnecessary pest, in a single year, may well afford food for reflection if not for indignation.

In connection with this subject we rejoice to be able to say that a measure which was urged upon the authorities by this committee as long ago as the winter of 1871-72 has now been adopted, and that Philadelphia, after having existed for two hundred years (for she will

celebrate her bicentennial only five years hence), and having a population of more than three-quarters of a million inhabitants, is at length supplied with a disinfecting station, at which clothing or furniture which has been exposed to contagion can be thoroughly purified.

This is a reform greatly needed, of the utmost value especially in regard to the spread of the scarlet fever and smallpox, and it is greatly to be desired that the public should appreciate the importance of availing themselves of this new facility for their self-protection. The building, which is in the shape of an annex to the Municipal Hospital, owes its existence to the persistent efforts of Dr. Welch, the efficient physician of the hospital, and of the active medical members of the Board of Health, Drs. Ashurst and Perri, who themselves drew the plans and superintended the erection of the building.

It must be said that, in the event of a wide-spread epidemic, this single station would be altogether inadequate to the needs of the city. But it is confidently hoped that its utility will be so self-demonstrating as to result in the establishment of several agencies at points convenient to the different sections of the immense area included within the city limits.

WHOPPING-COUGH and MEASLES were both mild, the former causing 88 and the latter 23 deaths. The same immunity of the colored race from the last named disease, at least in a fatal form, as has been adverted to in former reports, is still noteworthy.

CEREBRO-SPINAL MENINGITIS, now thoroughly domesticated with us, carried off about an average number, 85; of whom 68 were minors and 53 females.

MALARIAL FEVERS of all kinds prevailed to but a trifling extent; but TYPHOID FEVER was unquestionably present to a greater degree than in any year since 1865, the number of deaths from it amounting to 161. This is the more noticeable from the fact that the previous year showed a decided falling off in the mortality from this disease. Indeed, your committee took occasion to congratulate the Society on this auspicious diminution, and to assign as the probable cause certain engineering operations calculated to improve the purity of our drinking water. To what are we to attribute this very considerable increase? Must we ascribe it to some purely local cause, or are we at liberty to connect it in any way with the meteorology of the year? As bearing closely upon this question, your committee ask leave to quote a foreign authority treating of the existence of the same disease in a European capital, and to call attention to the fact that the fluctuations of the fever bear the same relation to those of temperature and moisture as his record that they are found

to do in our own experience. We quote, from the *London Lancet* of Jan. 13, 1877, a sketch of the recent epidemic of typhoid fever in Paris, by Dr. Bourdon, Physician to "La Charité Hospital." He says: "If we investigate the atmospheric conditions, which might be regarded as constituting the causes of this epidemic, it will be found that, in the months antecedent to the outbreak, the rainfall was below the average proper to this period of the year—that there had been in fact a great drought. The temperature rose as usual, and remained moderate for some time. On the 9th of June, however, it suddenly increased, and continued excessively high until the 17th of August. On the 18th of August it fell considerably, and the rains began. In September the drought had passed away; 69 millimetres (2.76 inches) of rain fell.

"The exacerbation of the disease distinctly coincided with the dryness and heat, and we may notice that the paroxysm is marked much more by the excess of the mortality than by the number of patients. It diminished with the cessation of the heat and dryness. The most severe cases occurred in August. The number of cases continued to augment subsequently to this period, but the relative mortality underwent a sudden reduction.

"*Etiology.*—The first question then is, Are we to regard these exceptional atmospheric conditions as the cause of the epidemic? No doubt can be entertained that the lowering of the bed of water in the subsoil exposed a whole series of putrid *foci*, and that the excessively high temperature was well adapted to induce fermentation, and at the same time to favor the diffusion of the effluvia produced by causing an unusual amount of evaporation. May we not then attribute to the miasmata so developed the leading part in the genesis of the typhoid fever? Whatsoever may have been the influence of this cause on the outbreak of the disease in August, the epidemic which had diminished during September and the beginning of October, burst forth with renewed intensity towards the middle of this month and continued to rage till November, so that the mortality which had fallen to 163 in October rose to 929 in November." The highest mortality was 39 per cent.

MORTUARY TABLE No. 3.

Typhoid Mortality of 1876 compared with that of 1875, and Typhoid Death-rate of 1876 compared with the average Typhoid Death-rate for ten years.

WARD.	Population.	General Mortality		Typhoid Mortality.		Typhoid Death-rate to 10,000 of population	
		1875.	1876.	1875.	1876.	Average.	1876.
1st	35,794	443	314	31	32	4.12	3.34
2d	28,242	773	346	15	31	4.55	7.43
3d	29,924	463	462	11	11	4.01	5.43
4th	29,545	830	656	16	16	3.84	7.78
5th	33,972	639	444	8	17	4.27	3.24
6th	12,970	264	212	8	16	3.33	3.13
7th	33,067	733	317	11	38	5.19	7.86
8th	23,868	449	447	7	19	3.34	7.96
9th	33,113	295	370	4	11	3.76	9.42
10th	24,786	493	457	7	23	3.75	11.34
11th	44,569	894	377	8	16	4.08	11.14
12th	33,334	396	304	8	11	5.15	7.14
13th	29,627	353	354	10	10	3.31	4.99
14th	23,245	493	440	8	27	5.30	11.54
15th	48,472	344	1,103	8	45	4.63	9.28
16th	18,903	300	436	7	15	6.11	7.93
17th	21,279	334	481	11	22	5.11	10.33
18th	28,286	311	705	28	30	3.34	13.79
19th and 31st	69,499	1,713	1,713	74	81	7.44	11.65
20th and 29th	75,828	1,500	1,838	47	48	4.11	3.21
21st	18,687	402	307	4	7	4.28	7.44
22d	28,482	401	491	13	17	2.97	3.96
23d	26,299	470	394	11	18	4.04	7.15
24th	51,310	711	399	15	44	3.72	8.57
25th	28,346	541	739	8	24	3.46	3.34
26th and 30th	56,842	1,138	1,782	21	41	3.39	7.21
27th	22,457	1,017	1,226	10	34	5.11	14.24
28th	24,381	392	473	13	8	3.38	3.24
Total		17,865	18,892	418	761		

It will be seen by reference to our tables, that our own outbreak began a little earlier and continued a little longer before the intermission, just as our heated term did. And that the same statements in the autumn and the same expectancy in the early winter were observable here as there. Berlin at the same time suffered from a very serious outbreak of the same disease. Other American cities found the purity of their water supply seriously impaired by the heat and drought.

A writer in the *Sanitation* of February, 1877, says of the Chelsea water in New York: "So impure was it after a severe rainfall in July and August of the present (past) season that the press of the city devoted entire pages to complaints and to discussions of the subject. One of the most remarkable facts noted was, that while the rainfall was greater in the former month than in any other July since 1873,

the Croton supply was impure, and had a foul odor, not only through the entire month, but through the preceding one."

And yet, such is the force of local prejudice, that men could actually be found fatuous enough to bottle up this reeking fluid and bring it on to Philadelphia in order that they might not be compelled to drink the Schuylkill water.

The report of the Maryland State Board of Health, by Dr. E. Lloyd Howard, mentions the occurrence in Baltimore last summer of an explosion of typho-malarial fever which cost the city fifty-nine lives, a large amount of suffering, and over eight thousand dollars.

It was to be expected, then, that Philadelphia, having a water supply, it must be admitted, not above suspicion—to the impurities of which, indeed, these reports have not failed to allude in terms of strong reprobation and urgent warning for the past six years—and having already a fixed typhoid death-rate of somewhat more than one per diem, should, under the combined aggravation of drought and excessive heat, have this death-rate greatly increased. That of Paris was trebled by these causes, as has been shown. That of Philadelphia was not doubled. We escaped, therefore, quite as well as we had any right to expect, and do not need to look further for an explanation of this augmented mortality. But in order to determine to what extent impurities in the Schuylkill may perhaps have been responsible, it will be of considerable importance to observe the localities in which the greatest increase occurred.

Your committee last year determined with approximate accuracy the fever haunts of the city as indicated by the record of ten years. If the returns for the year under discussion correspond closely with the distribution thus determined, we may conclude that conditions already existing were simply intensified by the heat and drought. But if there are marked discrepancies, it becomes a matter of consequence to inquire into the meaning of these discrepancies. The first point which impresses us in glancing over our table of ward returns is the much more uniform dissemination of the disease throughout the entire city. Instead of confining itself to the Delaware front and certain densely crowded and notoriously insanitary sections, as heretofore, it has existed to an alarming extent in every quarter, and in some of the healthiest districts. The second is, that its increase in specified sections bears no relation to the general increase of mortality. The third—that while in the regions recognized as its favorite abodes, it manifests about such a rate of increase as the growth of population, and the unfavorable atmospheric conditions of the year would warrant us in anticipating, in portions of the city which have usually been comparatively free

from its ravages, it has far exceeded this rate. The first of these propositions is too much a matter of personal experience with every one present to need detailed proof. Of the second, the following are instances: The deaths from all causes in the Second Ward fell off from 729 in 1875 to 640 in 1876, while the deaths from typhoid increased from 15 to 21; the deaths from all causes in the Fifth Ward were slightly reduced, those from typhoid were more than doubled; a decided reduction of general mortality in the Ninth and Tenth Wards accompanied a nearly fourfold increase of typhoid, and in the Eleventh Ward a more than threefold. On the other hand, in the Twenty-eighth Ward the death-rate increased from 492 to 473, and the typhoid deaths fell from 13 to 8. The only other ward in which there were fewer deaths from typhoid than in 1875 was the Twenty-third, where they were reduced from 23 to 18, while at the same time the general mortality diminished in nearly the same ratio. An addition of 338 to the whole number of deaths in the Twentieth (including the Twenty-ninth) Ward, accompanied only one additional typhoid death. We may note in passing, however, singular coincidences of stationary death-rates in respect to both general and specific causes. In the Third Ward the mortality was practically identical in the two years, 483 and 482, and the typhoid mortality was also identical, 11 in both years. The same was true of the Thirteenth, in which the figures were 353 and 354 for the former, and 19 in both for the latter; and approximately of the Nineteenth (including the Thirty-first), when the mortality was 1713 in both years, and the typhoid mortality only increased from 74 to 81. The examples which illustrate the second are equally pertinent to the third proposition.

The increase from 15 to 44 deaths from this affection in the Twenty-fourth Ward, in which the Centennial Building were situated, does not surprise us. Its suddenly doubled population, its hastily erected dwellings, with their imperfect and often deficient sewerage, its immense areas of undrained land, often lying under stagnant water, and of newly upturned soil, all would lead to the anticipation of such an outbreak.

But what shall we say of the Eighth, Ninth, Tenth, and Fifteenth, contiguous wards, lying along the Schuylkill, possessing every vantage in point of location, drainage, architecture, and population, comprehending within their limits the residences of our wealthiest citizens, and heretofore exhibiting the lowest death-rate from typhoid of any of the built-up parts of the city? Why does the Tenth suddenly advance from its average typhoid death-rate of 3.75 to 19,000 persons living to one of 11.89, higher than that of the

Nineteenth, which is 11.65? We fear there can be but one answer to this question. The only factor in the production of this affection, so far as we know with positive assurance, which could have been materially increased either in quantity or efficiency, was *infectious material in the drinking water*, and the drinking water of all this section comes from *Fairmount dam*.

The fact is a significant one that the increase was most marked in the Fifteenth Ward, jumping from eight up to forty-five, when we remember that this ward is principally supplied by the Spring Garden Water Works, which draw their supply from a point in the river acknowledged to be seriously contaminated by sewage. The drainage of a number of breweries into the river at a point above the dam is instanced. All the other conditions of this section—drainage, sewerage, cleanliness, food supply, etc., were as usual, and we cannot, therefore, look to them for an explanation. The intense heat, the long drought, the increasing population along the river banks, and especially the disturbance of the bottom of the stream by the immensely increased steam navigation during the summer, are sufficient to account for a decided increase in the morbid material held in suspension in the water, without the supposition that the excrementitious sewage of the Exhibition grounds reached it in any appreciable quantity.

But our report would, notwithstanding, not be complete without a reference to the so-called "Centennial Sickness," the fame of which certain sensational sheets, never friendly to the great enterprise, took care to spread far and wide throughout the country.

As seen in Philadelphians, independently of typhoid fever, it almost invariably assumed the diarrhoeal type, and was very amenable to treatment. In many instances each visit to the Exhibition was followed by an attack of looseness of the bowels, accompanied or not by nausea, which usually passed off in a day without further care than attention to the diet.

After reading carefully all the authentic reports from medical observers which have appeared upon this subject, however, your committee are of the opinion that this affection was not one but many diseases—in one case simple diarrhoea, in another pure debility, in a third true typhoid, in a fourth typho-malarial fever, and so on—and that in a large proportion the visit to the Exhibition was but the spark which kindled morbid fuel already piled up in the system.

They attribute their existence, beyond the obvious and sufficient causes of fatigue, exposure, excitement, and improper diet, to a poisonous condition of the atmosphere, in the buildings and about

the grounds of the Exhibition, owing, in the first place, to *crowding*—the emanations from such immense congregations of human beings, so closely packed together, vitiating the air beyond the power of any system of ventilation to purify it, especially where intense heat is stimulating the sudoriferous glands to the *utmost* degree of activity—even the open air becoming on some occasions noticeably impure from this cause; and, in the second, to *imperfect drainage* and the want of proper sanitary precautions during the years of preparation. The chairman of this committee took occasion at three different times to call the attention of the Medical Director to evils of this nature, and has reason to believe that they were rectified in those particular instances. But the committee cannot but feel that the mistake of the Commission was, that it inaugurated and carried out this great undertaking, involving the lives and health of millions of their fellows, without appointing a single officer whose duty it was to superintend its engineering operations *in the interests of public health—a sanitarian as such*. It was not until the end of November, 1873, that the accomplished Medical Director received his appointment, when too late to make any alteration in architectural or engineering sanitary arrangements; nor did his authority extend beyond the organization and control of a bureau of medical relief. The admirable efficiency of this service, and the dignified and unobtrusive manner in which its delicate duties were performed, must not be passed by in silence, but cannot atone for the previous culpable neglect of the Commission in this regard. It is not probable that any very large amount of fecal pollution reached the *Edgely Hill* from the Exhibition grounds, but the impure condition of the atmosphere at many points, and especially in Lansdowne ravine where so many resorted to listen to the music of the bands, to rest and to lunch, was but too palpable to the sense of smell.

While fully recognizing thus the glaring defects in the sanitary provisions of the Exhibition, your committee feels that it was due both to Philadelphia and to the Commission, to point out the fact that, on the other hand, a certain amount of mortality was inevitable among the large numbers who thronged the city and the industrial palaces, and that the fact of a death occurring after a visit to the "Centennial," was by no means a proof that the visit was the cause of the death. A careful estimate was, therefore, made of this terrible mortality and published in one of the daily papers the early part of the present year, "in order to remove as far as possible any unfavorable impression which might still

linger in the minds of those who had personal knowledge of cases of illness supposed to have been contracted there."

The problem proposed was this:—

What number of deaths and what amount of sickness might have been naturally looked for among those who visited the International Exhibition from a distance?

The factors of the problem were, first, the whole number of visitors; secondly, the normal death-rate for the United States, averaged for large and small towns and the country; and, thirdly, modifying circumstances.

It was considered that the 8,400,000 paid admissions indicated, making all due allowance for those from this city, a total of visitors from a distance of 2,300,000.

Let us now endeavor to arrive at the nominal death-rate for such a host in a corresponding period of time.

The death-rates of our great cities for the year 1874, which was a favorable one in respect to public health, were as follows per thousand of living population: New York, 27.61; Philadelphia, 19.54; Brooklyn, 24.46; St. Louis, 16.27; Chicago, 20.31; Baltimore, 21.14; Boston, 23.60; Buffalo, 18.46; the highest being those of Charleston, S. C., 38.96, and Savannah, 35.38. Of exceptionally healthy small cities we may cite Syracuse, 15.20; Toledo, 10.90; (?) Hartford, 12.86, and Springfield, Ill., 12.23, the average health of which is probably even better than that of country villages and rural districts. From these data we are justified in assuming for the entire country a death-rate of 18 per 1000, which means that of every thousand persons living during a year, eighteen must inevitably die before the expiration of the year. (In this calculation we have not included the excessive mortality of the Southern cities, presumably the result of epidemic influences of an unusual character.) So much for the second factor.

Third, the "modifying circumstances" to be taken into account are, first, incremental, viz., the season of the year, the unusual character of that season, and the prejudicial modes of life of the great majority of the visitors: secondly, largely subtrahendal, namely, the time of life at which most of them had arrived. First, incremental: It is a well-known fact, that during the summer months the mortality in all of our large cities invariably increases. During the past summer, owing to the exceptionally high temperature which prevailed (the average for July having been more than six degrees higher than that for the same month of last year), the increase was greater than usual. That of New York ran up to the alarming figure of 48.12, and of Brooklyn to 42.10, being 20 above the

annual average of the former, and 17 above for the latter city. In commenting on and accounting for this terrible mortality, that excellent journal, the *Sun*, published in New York, says: "The 'heated term' is also found to seriously affect the Croton; it being the same term as the grazing, when the Croton's tributary streams, with unprotected banks, traverse luxuriant meadows; when summer resorts distribute their sewage; when the 'cattle open a thousand hills' gently sloping to streams made picturesque by the revelling of geese and ducks, and swine cooling themselves in the margins—all permitted—make the water smell 'loud' and taste 'rapid.'" Farther on, the same article speaks of the necessity for "holding our breaths and biting our tongues lest we smell and taste the decomposing organic matter in the Croton." The impure condition of the drinking water, however, not peculiar to the city just mentioned, is but one of numerous causes which render an American summer dangerous to human health and destructive to human life. We shall be extremely moderate if we allow 3 per 1000 additional on account of the season and as many more on account of the peculiarly fatal character of the season. Add to this the fact that the vast crowds visiting the Centennial arrived in the city worn out with travel and loss of sleep, endured excessive fatigue while here, exposed themselves rashly both to midday sun and evening damps, ate much indigestible and promiscuous food at unaccustomed hours, often going fasting when their systems were in an exhausted condition—and all this under a cerebral pressure of intense excitement—and we have established another factor of increment at least equal in value to either of the other two. Our annual death-rate for this exceptionally trying period would thus advance from 18 to 21 per 1000, a little less than that of New York at all seasons.

This is to be reduced one-half on account of infants and invalids not attending, which gives a death-rate of 12.50 per annum. That this is probably below the mark is indicated by the fact that the annual death-rate of the New York police force, a body of picked men at the age of greatest expectation of life, living under a strict regime and generally favorable hygienic conditions, is 15 per 1000.

It still remains to be determined what length of time we are to cover in our calculation. For, although all the Centennial visitors were living from the commencement of the Exhibition, and although large numbers of them arrived here with the seeds of disease in their systems, still we are not at liberty to bring them into the question until they passed the gates.

A careful estimate of the admissions at different periods, leads to the conclusion that ten weeks will be an allowance erring upon the safe side. Now the rate which we have adopted for a year gives us

a rate of 2.6 for ten weeks. In other words: It was written in the inevitable decrees of Providence, more inexorable than the "law of the Medes and Persians which altereth not," that of every ten thousand of the eager multitudes who, month after month, were pressing onward with such glad anticipations to this wondrous concourse of earth's peoples and exhibit of their products, at least twenty-six should step quickly down from the thronged and glittering palaces of Art and Industry into the silent chambers of the tomb. The Centennial Commissioners, able, sagacious, far-seeing, and provident as they have proved themselves in many respects, had no power to stay this edict—could confer no brief immunity from nature's laws.

Recurring to our totals, we find that it was only natural, therefore, to expect that up to the eleventh day of December, one month after the close of the Exhibition, six thousand deaths should have taken place among our returning guests, representing probably sixty thousand cases of illness of greater or less severity. It is natural also to expect that a certain proportion of these cases should have been typhoid fever. If we allow only .03 per cent., this will give us about one hundred and eighty deaths from this affection strictly, or in the neighborhood of two thousand cases.

It is not surprising, therefore, that we should hear of a Centennial fever.

Allow us, in conclusion, to present a typical case of this disease which came to the notice of a member of the committee: A family came on from a small town in Connecticut, and took rooms in a new hotel, hastily run up, just outside the Exhibition grounds. They visited the latter faithfully and conscientiously, as New Englanders will, remaining for about a week. The party was a large one, of all ages. Soon after their return home, it was reported that one of the children of the family was very ill with typho-malarial or gastric fever—unmistakable evidences of the insanitary conditions prevailing in West Philadelphia—but for an additional fact, which was afterwards learned, namely, that this child was the only member of the family which did not go to Philadelphia at all, but remained at home in the salubrious air of its native town. The others all escaped.

Not denying, then, that the sanitary administration of the Exhibition was open to severe criticism, your committee wish to call attention to the fact that it was entirely unjust to expect, as seems to have been expected, that a visit to the Centennial should ensure the visitor a temporary immortality.

BENJAMIN LEE, *Chairman*,
A. D. HALL,
R. BURNS.
H. Y. EVANS,
H. LEAMAN.

MORTUARY TABLE No. 5.

Record of Causes of Death in the City of Philadelphia, from January 1, 1876, to January 1, 1877.

(Abridged from the Tables of Dr. William H. Ford, Secretary of the Board of Health.)

CAUSES OF DEATH.	Total.	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2 years.	2 to 5 years.	Adults.	Minors.	People of color.	Nativity.		
												United States.	Foreign.	Unknown.
ALL CAUSES	18,892	9848	9044	4964	4372	4551	1491	1590	9556	9,336	1027	14,022	3938	932
SPECIFIED CAUSES.....	18,812	9809	9003	4940	4358	4521	1488	1589	9514	9,298	1020	13,967	3917	928
CLASSES.														
I.—Zymotic diseases	4,761	2472	2289	1883	1729	1263	617	940	1149	3,612	177	4,199	463	99
II.—Constitutional diseases	4,194	2063	2131	678	640	698	202	120	2876	1,318	307	2,911	1006	247
III.—Local diseases.....	7,300	3910	3390	1782	1519	1722	606	489	3999	3,301	421	5,206	1749	345
IV.—Developmental diseases	1,943	993	950	498	407	788	31	14	1068	875	87	1,307	475	161
V.—Violent deaths.....	694	507	187	153	77	80	15	27	464	230	35	399	215	80
ORDERS.														
I.—1. Miasmatic diseases.....	4,627	2372	2255	1846	1714	1228	612	937	1067	3,560	173	4,123	433	71
2. Enthetic diseases	31	29	8	18	6	16	3	1	7	24	1	29	1	4
3. Dietic diseases.....	85	64	21	7	4	4	1	1	74	11	3	32	29	24
4. Parasitic diseases.....	18	13	5	12	5	15	1	1	1	17	...	18	...	...
II.—1. Diathetic diseases	500	195	305	24	28	10	4	15	448	52	26	273	189	34
2. Tubercular diseases	3,694	1868	1826	654	612	688	198	103	2428	1,290	281	2,638	847	209
III.—1. Diseases of nervous system	2,952	1641	1311	925	783	970	327	241	1244	1,708	141	2,291	549	112
2. Diseases of organs of circulation	867	452	415	75	69	33	6	17	723	144	67	535	278	54
3. Diseases of respiratory organs	1,945	1020	916	498	459	478	209	168	988	957	150	1,413	448	84
4. Diseases of digestive organs	1,055	535	520	231	176	231	61	47	648	407	37	706	323	26
5. Diseases of urinary organs	370	223	147	40	25	4	3	14	305	65	18	194	113	63
6. Diseases of generative organs	72	3	69	1	2	...	...	...	69	3	6	42	26	4
7. Diseases of organs of locomotion	24	18	6	8	2	...	...	1	14	10	1	14	8	2
8. Diseases of integumentary system.....	15	9	6	4	3	6	...	1	8	7	1	11	4	...
IV.—1. Developmental diseases of children	158	86	72	86	72	141	16	1	...	158	4	158	...	...
2. Developmental diseases of adults.....	33	...	33	...	4	...	...	...	29	4	2	21	9	3
3. Developmental diseases of old people.....	599	210	389	...	...	...	...	599	...	...	26	291	292	16
4. Diseases of nutrition	1,133	600	533	382	331	647	35	13	440	713	61	867	174	112
V.—1. Accident or negligence ..	525	398	127	124	62	48	11	26	399	186	23	300	159	66
2. Homicide.....	22	20	2	4	...	2	...	...	18	4	4	14	5	3
3. Suicide.....	60	46	14	1	1	...	...	...	58	2	...	29	27	4
6. Violent deaths (not classed).....	7	4	3	...	...	...	...	...	7	...	1	1	3	3
Causes not specified or ill-defined.....	80	39	41	24	14	30	4	1	42	38	7	55	21	4
CLASS I.—Zymotic diseases.....	4,761	2472	2289	1883	1729	1263	617	940	1149	3,612	177	4,199	463	99
I.—ORDER 1. Miasmatic diseases	4,627	2372	2255	1846	1714	1228	612	937	1067	3,560	173	4,123	433	71
Smallpox	469	234	175	143	136	99	35	102	180	279	26	350	48	6
Measles.....	53	31	22	31	20	14	13	21	2	54	...	42	1	...
Scarlet fever.....	328	179	149	176	147	18	39	170	5	323	2	323	5	...

¹ For want of definite information, some causes of death are placed under this order that properly belong under Order No. 4.

² Order 2 comprises violent deaths in battle, and is therefore omitted.

MORTUARY TABLE No. 5.—Continued.

CAUSES OF DEATH.	Total.	Males.	Females.	Boys.	Girls.	Under 1 year.	1 to 2 years.	2 to 5 years.	Adults.	Minors.	People of color.	Nativity.		
												United States.	Foreign.	Unknown.
III.—ORDER 2. Diseases of organs of circulation.....	867	432	415	75	69	33	6	17	723	144	67	535	278	54
Pericarditis.....	106	46	60	17	16	2	...	5	73	33	6	78	22	6
Aneurism.....	20	16	4	...	...	...	...	...	20	...	3	8	8	4
Angina pectoris.....	21	8	13	...	3	...	...	1	18	3	1	14	6	1
Hypertrophy of heart.....	71	37	34	7	6	...	1	2	58	13	11	48	22	1
Embolism.....	9	4	5	1	...	...	...	...	8	1	...	4	5	...
Heart disease, etc.....	640	341	299	50	44	31	5	9	546	94	46	383	215	42
III.—ORDER 3. Diseases of respiratory organs.....	1,945	1029	916	498	459	478	209	168	988	957	150	1,413	418	84
Laryngitis.....	67	41	26	30	20	16	12	15	17	50	1	57	10	...
Bronchitis.....	363	180	183	140	135	181	61	30	88	275	38	310	43	10
Pleurisy.....	89	55	34	12	10	6	2	5	67	22	8	45	35	9
Pneumonia.....	1,082	564	518	238	228	198	108	94	616	466	80	768	263	51
Asthma.....	50	26	24	3	2	3	...	1	45	5	3	20	25	5
Lung disease, etc.....	294	163	131	75	64	74	26	23	155	139	20	213	72	9
III.—ORDER 4. Diseases of digestive organs.....	1,055	535	520	231	176	231	61	47	648	407	37	706	323	26
Pharyngitis.....	14	9	5	8	5	...	2	8	1	13	1	13	1	...
Gastritis.....	17	9	8	3	3	1	...	3	11	6	...	12	5	...
Enteritis.....	431	213	218	146	115	160	48	26	170	261	12	342	85	4
Peritonitis.....	133	52	81	12	7	4	...	1	114	19	7	77	58	3
Ascites.....	38	10	28	2	5	...	...	3	31	7	5	19	18	1
Ulceration of intestines.....	25	13	12	3	4	...	3	...	18	7	...	15	7	3
Hernia.....	28	14	14	3	...	2	1	...	25	21	2	20	7	1
Ileus.....	47	28	19	15	6	17	...	...	26	21	2	30	15	2
Intussusception.....	23	13	10	8	4	9	...	...	11	12	...	17	6	...
Stricture of intestines.....	8	2	6	...	...	...	...	...	8	...	1	4	4	...
Fistula.....	1	1	...	...	...	...	...	...	1	...	...	1	...	...
Stomach disease, etc.....	22	11	11	2	5	6	1	...	15	7	1	15	6	1
Disease of intestines, etc.....	32	16	16	7	5	7	1	2	20	12	...	22	10	...
Hepatitis.....	73	39	34	6	6	7	3	1	61	12	2	38	33	...
Jaundice.....	28	19	9	10	5	13	...	1	13	15	...	19	8	1
Liver disease, etc.....	131	82	49	4	6	5	...	2	121	10	4	58	65	8
Spleen disease.....	4	4	...	2	...	...	2	...	2	2	...	4	...	...
III.—ORDER 5. Diseases of urinary organs.....	370	223	147	40	25	4	3	14	305	65	18	194	113	63
Nephritis.....	35	19	16	7	5	1	1	3	23	12	1	21	5	9
Ischuria.....	5	3	2	1	1	...	...	...	3	...	...	4	1	...
Bright's disease (nephria).....	186	103	83	15	13	...	...	7	158	28	15	88	60	38
Diabetes.....	19	9	10	1	2	1	...	...	16	3	...	12	6	1
Cystitis.....	30	23	7	3	1	...	...	1	26	4	...	18	9	3
Kidney disease, etc.....	95	66	29	13	8	2	2	3	79	16	2	51	32	12
III.—ORDER 6. Diseases of organs of generation.....	72	3	69	1	2	...	...	...	69	3	6	42	26	4
Ovarian dropsy.....	7	...	7	...	...	...	...	...	7	...	1	3	3	1
Disease of the uterus, etc.....	65	3	62	1	2	...	...	...	62	3	5	39	23	3
III.—ORDER 7. Diseases of organs of locomotion.....	24	18	6	8	2	...	...	1	14	10	1	14	8	2
Synovitis (arthritis).....	2	2	...	1	...	...	...	...	1	1	...	1	...	1
Joint disease, etc.....	22	16	6	7	2	...	...	1	13	9	1	13	8	1
III.—ORDER 8. Diseases of integumentary system.....	15	9	6	4	3	6	...	1	8	7	1	11	4	...
Phlegmon.....	11	7	4	2	2	3	...	1	7	4	...	8	3	...
Skin disease, etc.....	4	2	2	2	1	3	...	...	1	3	1	3	1	...
CLASS IV.—Developmental diseases.....	1,943	896	1047	468	407	788	51	14	1068	875	87	1,307	471	161
IV.—ORDER 1. Developmental diseases of children.....	158	86	72	86	72	141	16	1	...	158	4	158	...	...
Cyanosis.....	102	55	47	55	47	96	5	1	...	102	3	102	...	...
Spina bifida.....	11	6	5	6	5	14	...	...	...	11	...	11	...	...
Other malformations.....	17	10	7	10	7	17	...	...	...	17	...	17	...	...
Teething.....	2	15	13	15	13	17	11	...	...	28	1	28	...	...

MORTUARY TABLE No. 5.—Continued.

CAUSES OF DEATH.	Total	Males	Females	Infants	Children	Under 1 year	From 1 year to 10 years	Over 10 years	Total	Males	Females	Percentage of foreign born	Nativity			
													United States	Foreign born	Native	Foreign born
IV.—ORDER 2. Developmental diseases of children.....	86	—	86	—	—	—	—	—	86	—	—	—	91	—	—	91
Paralysis.....	1	—	1	—	—	—	—	—	1	—	—	—	1	—	—	1
Cerebral palsy.....	32	—	32	—	—	—	—	—	32	—	—	—	26	—	—	26
IV.—ORDER 3. Developmental diseases of old persons.....	299	166	133	—	—	—	—	—	299	—	—	—	261	—	—	261
Old age.....	299	166	133	—	—	—	—	—	299	—	—	—	261	—	—	261
IV.—ORDER 4. Diseases of nutrition.....	1,153	699	553	—	—	—	—	—	1,153	713	—	—	897	174	—	897
Atrophy and debility.....	1,153	699	553	—	—	—	—	—	1,153	713	—	—	897	174	—	897
CLASS V.—Violent deaths.....	464	267	187	—	—	77	80	15	27	464	267	—	386	183	—	386
V.—ORDER 1. Accident or negligence.....	325	188	137	—	—	48	11	—	—	325	188	—	300	125	—	300
Fractures and contusions.....	20	11	9	—	—	—	—	—	—	20	11	—	1	—	—	1
Wounds.....	11	11	—	—	—	—	—	—	—	11	—	—	7	—	—	7
Burns and scalds.....	55	27	28	—	—	24	4	4	11	55	27	—	41	—	—	41
Poison.....	18	11	7	—	—	—	—	—	—	18	11	—	12	—	—	12
Drowning.....	111	69	42	—	—	4	—	—	—	111	69	—	86	—	—	86
Suffocation.....	260	156	104	—	—	41	7	5	11	260	156	—	164	94	—	164
V.—ORDER 2. Homicide.....	22	20	2	—	—	2	—	—	—	22	20	—	14	—	—	14
Murder.....	22	20	2	—	—	2	—	—	—	22	20	—	14	—	—	14
V.—ORDER 3. Suicide.....	30	16	14	—	—	1	—	—	—	30	16	—	27	—	—	27
Wounds.....	27	17	10	—	—	—	—	—	—	27	17	—	11	—	—	11
Poison.....	1	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—
Drowning.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Suffocation.....	18	13	5	—	—	—	—	—	—	18	13	—	11	—	—	11
Other.....	3	1	2	—	—	—	—	—	—	3	1	—	—	—	—	—
V.—ORDER 6. Violent deaths (not specified).....	7	4	3	—	—	—	—	—	—	7	4	—	1	—	—	1
Causes not specified or ill-defined.....	7	4	3	—	—	—	—	—	—	7	4	—	1	—	—	1

METEOROLOGICAL TABLE No. 1.

A General Abstract of the Meteorological Observations made at Philadelphia, Pa., during the year 1876.

By JAMES A. KIRKPATRICK, A.M.

Latitude $39^{\circ} 57\frac{1}{2}'$ N. Longitude $75^{\circ} 11\frac{1}{4}'$ W. from Greenwich. Barometer found $55\frac{1}{2}$ feet above mean tide in the Delaware River.

1876. MONTHS.	Thermometer.				Rain or melted snow.		Clouds.				Relative humidity.										
	Maximum.	Minimum.	Mean daily range.	Means.	No. of days it fell.	Amount in inches.	Clear. days 3 or less covered.	Cloudy. days More than 3 covered.	Means of sky covered.			Maximum.	Minimum.	Means.							
									7 A. M.	9 P. M.	Monthly.										
January,	69	18	8.01	37.44	44.77	39.73	40.64	9	1.63	9	22	63	67	52	60.5	p. e.	p. e.	p. e.	Monthly		
February,	62	13	6.06	33.52	40.98	37.14	37.21	16	4.35	9	20	60	60	65	53	59.5	93	13	68	65	59.5
March,	69	16	6.59	36.13	44.28	40.06	40.16	12	6.65	9	22	60	66	52	59.3	93	17	66	46	65	59.5
April,	74	33	5.27	47.33	58.88	51.02	52.41	11	1.95	10	20	47	67	42	52.0	84	7	60	34	51	46.8
May,	87	37	6.24	59.10	71.21	63.21	64.51	10	3.79	9	22	57	64	47	56.1	88	21	65	45	63	57.5
June,	96	56	3.53	73.43	84.78	76.85	78.35	11	1.69	9	21	51	63	38	50.7	86	24	71	45	67	61.0
July,	102	65	3.09	78.98	88.66	81.87	83.17	11	4.54	8	23	39	63	45	49.0	85	30	65	42	62	56.5
August,	94	60	2.94	74.05	83.94	77.85	78.61	7	1.37	12	19	58	64	26	49.4	87	22	70	48	64	60.5
September,	90	52	3.87	64.17	72.07	67.28	67.84	18	8.09	6	24	68	69	56	64.3	89	28	72	56	68	65.4
October,	74	34	5.50	50.02	59.60	54.43	54.68	9	1.03	9	22	53	53	50	52.2	94	21	66	47	64	59.1
November,	76	27	4.48	46.02	51.87	48.22	48.70	13	5.50	5	25	68	69	58	65.2	100	30	70	59	69	66.2
December,	54	6	6.33	26.34	31.29	28.47	28.70	11	2.36	11	20	60	63	48	56.7	90	19	67	53	67	62.1
Annual means,	max 102	min 6	5.16	52.21	61.03	55.51	56.25	total 138	42.95	106	260	57	64	47	56.3	max 100	min 7	67	47	64	59.3
Winter,	69	12	6.55	35.26	42.16	38.36	38.59	39	8.90	25	66	65	69	58	64.1	93	13	68	51	65	61.5
Spring,	87	16	6.03	47.52	58.12	51.43	52.36	33	12.39	28	64	55	66	47	55.8	93	7	62	41	59	53.9
Summer,	102	56	3.19	75.48	85.79	78.86	80.05	29	7.60	29	63	50	63	36	49.7	87	22	69	45	64	59.3
Autumn,	90	27	4.62	53.40	61.18	56.64	57.07	40	14.62	20	71	63	64	55	60.6	100	21	69	54	67	63.6
Means for 25 years,	max 102	min -9	5.45	50.26	59.80	53.67	54.58	anual 126	46.74	110	256	60	61	46	55.7	max 100	min 7	73	55	70	66.3

The thermometer was highest, 102°, on the 9th of July.

" lowest, 6°, " 10th of December.

It will be seen that the maximum temperature, 102°, on the 9th of July was the highest for twenty-five years.

The warmest day was July 9th.

" coldest " Dec. 9th and 10.

Mean temperature $55\frac{10}{100}$.
" " 160.

METEOROLOGICAL TABLE No. 2.

Great or sudden changes of Temperature at Philadelphia, Pa.

1876.											
January	9.	Thermometer fell from 54° at 9 P. M. to 24° at 9 P. M. next day. Change 30									
	10.	"	"	"	55	"	7 A. M.	"	22	"	7 A. M.
	19.	"	"	"	58	"	7 A. M.	"	32½	"	7 A. M.
February	1.	"	"	"	45	"	9 P. M.	"	19½	"	9 P. M.
	15.	"	"	"	55	"	7 A. M.	"	32	"	7 A. M.
	22.	"	"	"	38½	"	9 P. M.	"	17	"	9 P. M.
March	8.	"	"	"	69	"	2 P. M.	"	45	"	2 P. M.
April	30.	"	"	"	62½	"	2 P. M.	"	40	"	9 P. M. same day.
May	5.	"	"	rose	52	"	7 A. M.	"	74	"	2 P. M.
October	14.	"	"	fell	69	"	2 P. M.	"	42	"	2 P. M. next day.
December	8.	"	"	"	40	"	9 P. M.	"	11	"	9 P. M.
	14.	"	"	"	53	"	9 P. M.	"	29	"	9 P. M.
	16.	"	"	"	36	"	7 A. M.	"	14	"	9 P. M. same day.

The mean temperature was below 32° on

January	11, 12, 13, 14, 30	. . . . .	=	5 days.
February	2, 3, 4, 5, 6, 23, 24, 25	. . . . .	=	8 "
March	2, 3, 18, 19	. . . . .	=	4 "
December	1, 2, 4, 5, 9, 10, 11, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 30, 31	. . . . .	=	21 "
Total				38 days.

And above 81° on

June	3, 10, 11, 24, 25, 26, 27, 28, 29, 30	. . . . .	=	10 days.
July	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22	. . . . .	=	22 "
August	6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 25	. . . . .	=	12 "
September	1	. . . . .	=	1 day.
Total				45 days.

APPENDIX A.

Extract from the Report of the Board of Health of the City and Port of Philadelphia for 1875, Descriptive of the Disinfecting Annex to the Municipal Hospital.

The building contains a hot-air chamber, a fumigating chamber, a bath-room, and a dressing-room. It is intended to add suitable apartments in which to keep articles before and after being disinfected, so that the establishment shall be complete in itself. A chamber heated by gas, such as the improved disinfecting apparatus of S. Leoni & Co., of London, or the gas stove of Dr. Ransom, of

Nottingham, would probably have been the best adapted for the purposes of the hospital, on the ground of economy, if for no other reason, could the supply of gas have been obtained.

A steam disinfecting chamber, such as that proposed by Dr. Esse, and in use in Berlin, has its advantages where steam is already in use. In the apparatus determined upon the heat is obtained from a cast-iron cockle situated in a cellar immediately under the hot-air chamber.

The building is constructed of stone, painted, and is one story high with a basement. It contains on one floor a bath-room, supplied with hot and cold water, six feet by eight feet, communicating with a dressing-room, eight feet by ten feet; a fumigating chamber, six feet by eleven feet; and a hot-air chamber, eight feet by eleven feet. The fumigating chamber is made perfectly tight, so as to completely confine the gases liberated for the purposes of disinfection. The articles to be purified are suspended, and exposed to the fumes of burning sulphur, or other gases, for hours, the length of time being regulated by the character of the substances submitted to the process.

The hot-air chamber is eight feet wide and eleven feet long, and eight feet to the spring of the arch. The interior wall is built of brick, arched at the top, and is nine inches in thickness. Between it and the outside wall is an air space for the object of economizing the heat. The door is made of wrought-iron set in a cast-iron frame, so that the chamber is perfectly fire-proof. The furnace is placed in a chamber immediately under the floor, which is laid in tiles of stone, supported on an iron frame-work. The heated air passes directly through an adjustable grating near the centre of the floor, over which a soapstone screen is placed to protect the clothing from the direct rays of heat. The smoke flue passes around the chamber under the floor before entering the chimney. At the top of the chamber there is an opening provided with a valve for the escape of air into a shaft leading into the chimney. Cold air is admitted from below into the space around the furnace. Valves control the openings for entrance and exit of air, which can be managed without entering the chamber. The thermometer can be examined from the bath-room through a slit in the wall, covered by glass. A temperature of 280 degrees Fahrenheit can be maintained for any length of time. A temperature of 344 degrees Fahrenheit has been reached; but above 250 degrees there is danger of scorching the clothing, and there is no necessity for a higher degree of heat. "The temperature at which infectious matter is rendered inert has lately been a subject of keen controversy, chiefly in relation to the temperature at which the vitality of living germs and minute

infusorial creatures is destroyed. The late Dr. Henry, of Manchester, demonstrated experimentally that the vitality of vaccine matter is destroyed at a temperature of 140 degrees Fahrenheit, and that the virus of scarlet fever is inert after being exposed to a heat 204 degrees Fahrenheit; but some of the lower organisms appear to be more tenacious of life, for, according to Dr. Grace Calvert, the common vibrio will bear a temperature of nearly 300 degrees, and his black vibrio, which appears to be a very salamander of animalcules, is not killed by a heat of less than 400 degrees Fahrenheit. After a long investigation, however, before the Académie des Sciences of Paris, it was unanimously agreed by all parties to the controversy of spontaneous genesis, that none of the lower organisms or their germs would resist in air a temperature of 130 degrees C. (= 266 degrees Fahrenheit), and in liquid a temperature of 110 degrees C. (= 230 degrees Fahrenheit). This, indeed, was the temperature fixed by Pasteur himself, although many of the members thought that 100 degrees C. (= 212 degrees Fahrenheit) was sufficiently high to destroy all vitality. In most cases, in fact, a temperature of 180 degrees Fahrenheit is sufficient to destroy infusorial life, for that will coagulate albumen, of which they are made. Assuming, however, that it is desirable to use as high a temperature as possible for disinfection, it is important to know what is the effect of heat on textile fabrics. Up to a temperature of 250 degrees Fahrenheit most of these fabrics are unchanged, unless the exposure is maintained for many hours, when they become discolored and slightly brittle. Above this temperature the change is more marked, and with a dry heat of 300 degrees Fahrenheit cotton fabrics are slightly charred, and, therefore, spoiled. At 400 degrees they become dark brown, and crumble into powder when rubbed. At 500 degrees gaseous hydrocarbons are produced, and at 600 degrees all vegetable and animal tissues are converted into charcoal, with the evolution of empyreumatic oil and gas. It would seem, therefore, that, for practical purposes, a heat of 250 degrees, aided by a jet of steam, for the purpose of diffusing the temperature and helping its action, may be safely applied to textile fabrics.¹

In using the chamber, care must be taken that none of the articles are in contact with the walls or floor. Small articles are placed upon a wire grating; mattresses and more bulky articles are suspended from the ceiling by means of clips composed of iron rods.

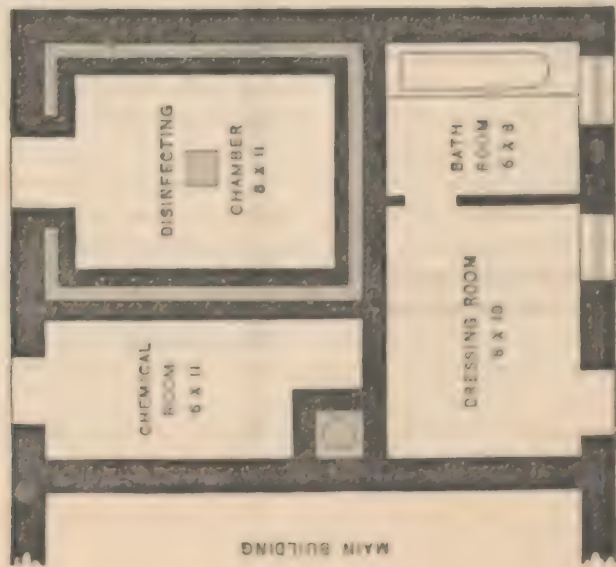
The introduction of the disinfecting apparatus supplies a want that has long been a source of embarrassment. Not only is such an establishment needed for the proper treatment of the clothing of

¹ The Right Use of Disinfectants, by Dr. H. Letheby, London.

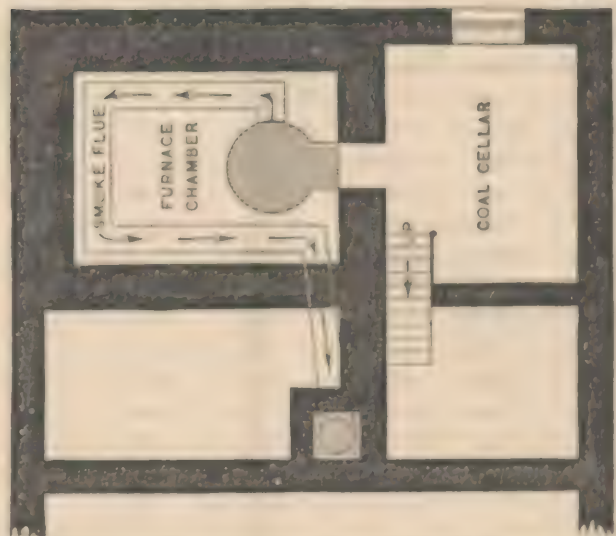
DAVID S. SCHULFE,
ARCHITECT.

BUILT BY
A. W. HAND.

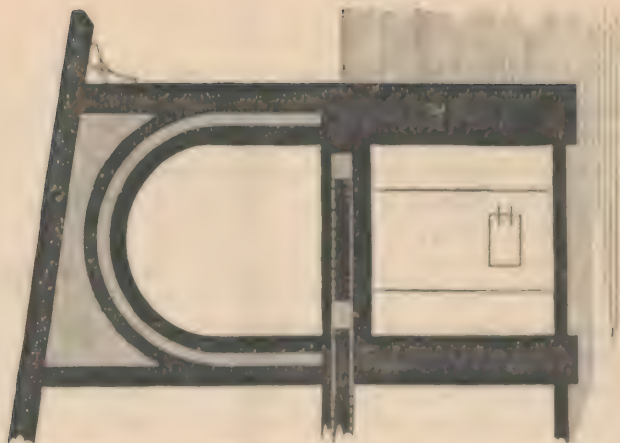
DISINFECTING ANNEX TO MUNICIPAL HOSPITAL, PHILA.



FIRST STORY PLAN



CELLAR PLAN



SECTION THROUGH DISINFECTING
AND FURNACE CHAMBERS

patients, and articles in use at the hospital, which cannot be thoroughly disinfected by the ordinary process of washing, but it is also of great service in the management of clothing, beds, bedding, etc., sent to the hospital for the express purpose of disinfection. Heretofore it has been necessary to burn many articles which might otherwise have been preserved and returned.

To prevent the spreading of contagion, the patients, before leaving the hospital, are compelled to take a bath, and are then supplied with non-infected clothing.

As a public health measure it is important that greater facilities for disinfecting articles of clothing, etc., be provided for citizens, and for this object one or more disinfecting chambers should be established in other parts of the city. The charges could be regulated so as simply to cover the expense, or the work might be done gratuitously, for the same reason that vaccination is offered to the people free of charge.

APPENDIX B.

United States Centennial Commission.

INTERNATIONAL EXHIBITION, 1876, PHILADELPHIA.

BUREAU OF MEDICAL SERVICE.

Owing to the very large number of persons who contemplate a visit to Philadelphia during the coming summer, it seems important that the utmost publicity should be given to the facts bearing on the sanitary condition of the city.

The following statistics, which have been obtained from the most authentic sources accessible, represent the mortality in some of the chief cities of the world during the past four or five years:—

	Number of years.	Average population.	Average total mortality.	Average death-rate per thousand.
Vienna	5	648,560	20,424	31.42
New York	5	994,458	29,601	29.93
Berlin	4	950,000	28,420	29.91
London	5	3,284,488	76,741	23.33
Paris	4	1,851,792	42,724	23.06
Philadelphia	5	744,831	16,573	22.27

While thus showing an average rate of mortality more favorable than that found in any other city containing over 500,000 inhabitants, Philadelphia has recently (1874) attained a degree of healthfulness almost unparalleled, viz., with a population at that time of 775,000, the number of deaths was but 14,966, giving a death-rate of only 19.3 per thousand. These very favorable results are largely due to the abundant and cheap water-supply, and to the opportunities given, even to the poorest citizens, for the enjoyment of pure

country air in the great Fairmount Park, which contains 2291 acres. The extent to which this is valued by the citizens may be inferred from the fact that during the year 1875 the Park was visited by over eleven million persons.

The most powerful influence of all, however, is the absence of that overcrowding of the population, which is the most fruitful source of sickness and death in many quarters of nearly all other large cities. This will be more clearly comprehended when it is remembered that the 817,188 inhabitants of Philadelphia are spread over an area of 129½ square miles, which are traversed by more than one thousand miles of streets and roads; and that the city contains, in addition to other kinds of buildings, 145,000 dwelling-houses occupied by families—a number exceeding by over 40,000 that of any other city in America.

The climate of Philadelphia is also, on the whole, a favorable one, although presenting many of the peculiarities common to inland localities. The mean annual temperature of the last ten years is 53.73° Fahrenheit; the average annual rainfall is about forty-five inches.

The following table exhibits the mean temperature of each month for the past ten years, showing that the range is far less extreme than is found in many other less favorably situated localities:—

Mean Temperature (Fahrenheit) of each month during the past ten years:

January	32.72° F.	July	78.74° F.
February	33.12° "	August	75.93° "
March	39.16° "	September	67.72° "
April	53.36° "	October	56.03° "
May	63.24° "	November	48.84° "
June	73.54° "	December	38.92° "

It is thus seen that only during the months of June, July, and August does the mean temperature rise to a high point. During this period there are very rarely any prevailing epidemic diseases; and the chief mortality occurs among children, especially among the poorer classes.

The health of Philadelphia at present is unusually good. Timely efforts have been made to secure an abundant water-supply to meet the great increase in the demand which must be expected this summer as compared with previous years. Constant watchfulness will be exercised by the authorities to maintain cleanliness, and to avoid or remove every possible cause of disease.

Within the Exhibition grounds a rigid sanitary inspection will be maintained, under the control of the Bureau of Medical Service; and thus a guarantee will be afforded that no cause of infection or disease will be allowed to occur through neglect of this important duty.

The object of this circular has been to call attention to the unusual sanitary advantages of Philadelphia, and to the preparations which have been made to insure the highest possible degree of healthfulness during the approaching Exhibition season. It is proposed to issue at certain intervals other circulars, announcing in an official and accurate manner the sanitary condition of the city, so that entire security may be felt by all who desire to visit the Centennial International Exhibition.

15th April, 1876.

WILLIAM PEPPER, M.D.,
Medical Director.

INTERNATIONAL EXHIBITION, 1876, PHILADELPHIA.
BUREAU OF MEDICAL SERVICE.

In a former circular issued from this Department, the exceptionally favorable position which is occupied by Philadelphia, in comparison with the other great cities of the world (*i. e.*, cities containing over 500,000 inhabitants), in regard to its sanitary advantages and average rate of mortality, was shown by carefully prepared statistics. In anticipation of the unusually large number of visitors who would undoubtedly be present in the city during the continuance of the International Exhibition, great efforts were made by the municipal authorities, as well as by those in charge of the Exhibition grounds, to obviate every cause of disease. The details of these arrangements will be published in the official reports of the various departments, which will appear after the close of the Exhibition.

It is owing to their thoroughness that, despite the very severe and prolonged heat of June and July, and the vast number of unacclimated strangers constantly present in Philadelphia since the 10th of May, the general health of the city has been remarkably favorable. With the exception of the four weeks ending July 22, the range of temperature for the past five months has been about the average. Thus, for the entire period of 20 weeks since May 10, the mean daily temperature has been 71.30° F., while the average for the same months during the past ten years has been 71.82° F. The mean temperature of the four weeks referred to (ending July 22), on the other hand, was 80° , 83° , 83° , and 81° respectively, giving an average for the month of 81.75° against 75.5° F., the mean temperature of the corresponding period of the previous year.

The following table, showing the relative mortality of Philadelphia and some of the larger American and European cities, has been prepared with strict care from the official records. The periods selected for comparison correspond as closely as possible. It will be seen, on careful examination, that the past season has not been an unfavorable one.

CITIES	Estimated Population	Number of weeks of rainfall data in 1970	Average monthly rain, mm. from typical 1960-1969	Average monthly rain, mm. from 1960-1969	Average monthly rain, mm. from 1960-1969	Average monthly rain, mm. from 1960-1969	Average monthly rain, mm. from 1960-1969
Los Angeles	2,254,000	1,025. 20 weeks (commencing the quarter ending January 1971) (see table 2)	200.6	200	1,407.4	1.66	602
PHILADELPHIA	2,000,000	10 weeks. (From weekly rain data for 1970)	80.5	110	108.0	4.54	6.07
CHICAGO	2,000,000	20 weeks. (From weekly rain data for 1970)	100	80	1.06	6.44	4.9
San Francisco	700,000	14 weeks. (From weekly rain data for 1970)	100.1	67.4	1.01	2.56	8.72
NEW YORK	2,000,000	10 weeks. (From weekly rain data for 1970)	98.9	65.1	1.75	6.04	6.07
PHILADELPHIA	2,000,000	10 weeks. (From weekly rain data for 1970)	93			1.76	
San Francisco	700,000	14 weeks. (From weekly rain data for 1970)	72.7	115	302	7.74	11.65
San Francisco	700,000	10 weeks. (From weekly rain data for 1970)	174.9	87	620.7	8.02	12.76
San Francisco	700,000	10 weeks. (From weekly rain data for 1970)	271		208	10.80	

It will be further observed that, as in the table published in the former circular, Philadelphia occupies an exceptionably favorable position. With the exception of London, whose rate of mortality is nearly identical, Philadelphia presents a considerably lower rate than any other of the great cities, while, in comparison with its nearest neighbors, New York and Brooklyn, its superiority is both striking and suggestive.

In calculating the rate of mortality in Philadelphia during the past twenty weeks, the population has been estimated at 900,000. Those who have carefully studied the movement of its population, expect, however, that in consequence of the large influx of visitors, this estimate is below rather than above the mean daily population. It must further be borne in mind that, while a considerable portion of its more favored classes were as usual absent from Philadelphia during the summer months, the lower classes, among whom the mortality is always greater at this season of year, were largely reinforced. If, in addition to this, it is considered that a comparatively large amount of sickness might have been expected among the vast throngs of unacclimated visitors reaching the city after long and hurried journeys, and exposed to excitement and excessive fatigue, the full significance of the remarkable table above given, will, it is hoped, be appreciated by all. As one of the most important factors in the maintenance of public health is the purity of the water supply, it is with great satisfaction that we learn from the official report furnished by Dr. Charles M. Cresson, the distinguished analytical chemist, that the purity of the water supplied from the Schuylkill River to the Exposition grounds and the neighborhood, is fully up to the standard of the past four years.

As the summer months, during which time alone any fears could be entertained for the development of wide-spread disease, have passed with such gratifying results, it is not premature to express the feeling of thankfulness and congratulation, that during this important year, Philadelphia has been favored with the same exceptionally low rate of mortality she has so long enjoyed.

WILLIAM PEPPER,

Medical Director.

THE DIAGNOSIS OF PSOAS ABSCESS.

THE case which I am about to relate, while sufficiently important in itself to merit rehearsal, as indicating the value of mechanical treatment in cases where a lesion of the spine is suspected, derives its importance, in the connection in which I introduce it, from the fact that up to the day on which I saw the patient, when I found him with a well-developed psoas abscess, none of the numerous physicians who had examined him had suspected its existence. As the diagnosis presented no difficulty to me, it occurred to me at the time that I should perhaps not be presuming if I should briefly place before the profession the modes by which I arrived at my conclusion.

HISTORY.—I was called to the Girard House on Sunday, Feb. 28, 1875, to see the son of Mr. E. W. H., a resident of an interior town in this State. He was a well-developed, sturdy, thick-set boy of ten years; but pale, and with a countenance indicating past suffering and present anxiety. His parents were both living; the mother in good health, the father a sufferer from neuralgia and nocturnal pains in the tibia, probably periosteal in their seat. He had one brother and two sisters, all of whom were in fair health. When four years old he was attacked with whooping-cough, which he had very severely. From this time forward his parents noticed an alteration in his gait and carriage. He was awkward in his movements, and could not run like other children. At two different times he had attacks of severe pain lasting for several days, originating in the left side and shoulder and extending around to the spine. The three physicians who saw him during these illnesses were unable to assign any cause for the paroxysms. In August, 1874, nine months before I saw him, he had met with a very severe fall from a hay-mow. The distance was almost fourteen feet, but the fall was somewhat broken by striking some steps on the way. The brunt of the blow was

borne by the left ischium. The pain was severe at the time, and although he endeavored to make light of it, as boys will, he has since confessed to me that he was stiff for a considerable length of time from its effects. Within a month after, he was attacked with acute pain in the left side of the abdomen, in the region of the descending colon. The agony was so intense that he was held on the lap for a week, the only relief being from strong pressure with the hand over the seat of pain. This pressure was kept up day and night. His sufferings continued for nearly three weeks; and it was six weeks before he was able to walk. When he did so, his gait was more awkward and his movements more constrained than ever. The family physician was inclined, from the seat of the pain, to ascribe it to inflammation of the colon, and based his treatment on that supposition. "From time to time," writes his father, "he was seen by a great many physicians and many of them thought him incurable." Matters went on in this way until about a month before, when it was noticed that his spine was curved to one side. His father then determined to bring him to Philadelphia for advice. He had been seen the day previous to my visit by a highly respectable surgeon, who pronounced the boy to be suffering from a trifling muscular contraction, and advised his father to take him home and let him run in the fields, and use Indian clubs and dumb-bells, promising that the difficulty would wear off of itself with exercise and fresh air. Notwithstanding the entire absence of pain at this time, and the fact that the patient had a good appetite, and appeared well nourished, I was unable, even at the first glance, to take so favorable a view of the case. And just here I desire to "embrace the occasion," as our clerical friends say, to preach a short sermon on the danger of underestimating the significance of muscular contraction. In my opinion, and it has been arrived at, not without extended observation and careful reflection, there is no such thing as a "trifling muscular contraction." Persistent contraction of a muscle is always a *serious* matter. It means mischief. Mischief, sometimes, it is true, simply in its own substance, in the shape of phlegmonous inflammation, when it will not be long in making its true nature apparent; but often—in the vast majority of cases—mischief in an entirely different and often distant organ—of which it is merely the reflection, and to the thoughtful observer, the index.

It is the index, first, of abscess disease in the joints. Long before the attention of parents or physicians is called to the hip in the early stage of coxalgia, the watchful hamstrings and gastrocnemius begin to contract, and, by slightly drawing the knee and elevating the heel, produce the peculiar limp which we have all of us learned to look

upon as almost pathognomonic of that treacherous disease. Contractions about the knee alone lead us to look for strumous disease in that joint, although it may have been entirely free from either pain or swelling. It is the index, secondly, of a cause of irritation in the course of a nerve trunk, or at its origin, or at its point of exit from the spinal foramen; or of disease, whether functional or organic, of the spinal cord, or even of the brain itself. It would be foreign to my purpose here to indicate the differentiation of the symptoms of these various phases of contraction of nervous origin. I will simply call attention to that very common form which goes under the misnomer of "*muscular rheumatism*," and for which, of late years, the more descriptive and non-committal name of *myalgia* has been proposed, and, still further to narrow it down, to that localization of it to which we assign the designation of stiff-neck in slighter, and torticollis or wry neck in severer cases. I believe that in all cases of obstinate torticollis, unless where the muscular tissue has itself been involved in injury or inflammation tending to suppuration, the lesion is in the spinal cord or in the nerve-trunk just after emission. In many cases I have been able to trace it back to a direct injury to the cervical spine, which had been forgotten by both parents and patient; in other cases, the connection of cause and effect had been so evident that they could not but notice it themselves. In the milder form I am strongly of the opinion that it depends upon a disturbance of the circulation of the spinal cord, due to general exhaustion of the system. The local condition may be one of anæmia or of hyperæmia, but the systemic condition is one of depression—and one of its most frequent causes is too much brain work or anxiety, often accompanied with loss of sleep. It is, therefore, if this view be correct, in no sense to be trifled with. Much the same cause operates lower down in the spinal column to produce lateral curvature. And how common is it in the early stage of this disease for the physician to slight the fears of the anxious mother; saying: "Oh, it's a trifle; let it alone; give her plenty of fresh air and exercise, and she'll outgrow it." I have rarely been consulted in a case of idiopathic lateral curvature, no matter how great the deformity, which had not gone through this experience. A British Review recently contained a superficial and rather ill-natured critique on a number of works on deformities, in which it took occasion to contrast in a very unfavorable light those physicians who are inclined to resort to the early use of mechanical appliances in such cases, with the "high-toned practitioner" who says, in his grand, off-hand manner, "My dear madam, there's absolutely nothing the matter with your daughter. Take her to the country;

let her ride on horseback every day; make her take a walk before breakfast, and drink plenty of milk"—with other well-meant platitudes—pockets his two guineas, and "hears nothing more of the case." It is true, he hears nothing more of it, but the correspondence may, and too often does. For, after months or years of weary, painful effort to follow out the prescribed *regime*, the unfortunate girl, now grown perhaps to womanhood, comes to beg him, if possible, to save from absolute wreck a form that might have been preserved a model of womanly beauty. Let us not, therefore, I urge, as we value our reputations as skillful diagnosticians, slight a muscular contraction. Muscles don't contract without a cause—a provocation. Seek out that cause. Determine that provocation. Let us nerve, joint, or organ, which, by direct or by reflex influence, could possibly be implicated in its production go unexamined. When we have sifted all these possible sources to a rigid scrutiny, and found them unflowing, then, and not until then, may we wholly venture to pronounce a contraction "*trying*." In the case of disease of the vertebra, it will be observed we have an opportunity for both sources of muscular irritation to come into play, namely, the articular and the nervous. But to return to our case.

Condition.—When I entered the room the patient was lying-dressed upon the bed. I observed, first, that he rose with great difficulty, turning on to the side before attempting to sit up, and holding his shoulders quite stiff. I requested him to walk with his clothing still on, and found that he stamped forward considerably, keeping the knees bent, the heels flat on the floor, the left toe pointed in, and the buttocks much projected posteriorly, especially on the left side. He complained of no pain in walking, and could even sleep down heavily with either or both feet without apprehension. There was a tendency to rest the left hand on the knee of that side. I now directed him to strip, and examined him first standing. I found that when he straightened out the right leg the left foot was raised from the floor, the hip being much and the knee slightly flexed. The spine was curved forward deeply in the lumbar region as in lordosis, but without any projection higher up. It also curved to the right, throwing the shoulders toward the left, and depressing that of the left side. I now made him sit down, when *præter* every particle of spinal curvature vanished, and in place of the lordosis there was the slightest possible bulging of the lumbar spine backwards, and a certain degree of rigidity in the protruded tract. It was evident, therefore, that the contraction producing the antero-lateral curvature was not in the muscles of the *dorsum* of the spine and trunk, but in those which flex the thigh on the pelvis, or *vice versa*.

Now the muscles which are concerned in the production of this movement are, on the one hand, the proper *flexors* of the thigh, whose contraction, plus certain other features, would indicate disease of the hip-joint; or, on the other, the *psaos* with the *iliacus*, whose contraction, usually that of the former only, would point to an irritation of that muscle by inflammation and suppuration, either originating in itself or in the contiguous vertebræ, or by transmitted nervous action caused by such vertebral disease. I decided against the existence of hip disease, first, from the position of the limb; the heel was not raised in standing or walking; the toes were turned in; and the trunk was flexed on the thigh, rather than the thigh upon the trunk; in other words, he bent the body forward rather than drew the limb up: secondly, from the absence, all through the case, of the characteristic starting pains at night, of flattening of the nates, of swelling about the joint, of pain in the knee, and of tenderness on pressure directly behind the head of the bone or upwards from the foot. There was also freedom of motion of the hip-joint within limits. The contraction was, therefore, located in the *psaos* muscle. I did not need to go further for my own conviction. In fact, the history of the case—whooping-cough of severe grade, followed by rigid and awkward carriage with disinclination to run—had, in itself, almost decided me from the outset. But it was necessary to give the father, if possible, some more definite and palpable proof of the nature of the disease, as I believed it to exist. It was important to determine whether suppuration had actually taken place, and, if so, to what extent. I therefore caused the patient to lie down on the floor on the flat of his back. On making careful pressure with the points of the fingers directly above the *ramus* of the pubes on each side of the abdomen, I found that while on the right side my fingers descended at once over the edge of the pelvic brim into the fossa, on the left side they met with a firmly resistant surface about level with the brim, and that I was obliged to follow up this surface for a couple of inches before I could penetrate at all into the abdominal excavation. This tumor was smooth and even, elastic—under firm pressure presenting a sense of deep-seated fluctuation—and rounding off gradually at its upper end. The presence of abscess of the left *psaos* muscle was therefore fully demonstrated. I expressed the opinion that it originated in disease of the spine, caused immediately by the severe fall alluded to, but primarily by the succussion of the vertebræ and cartilages years before by the paroxysms of whooping-cough; and that treatment should, therefore, be directed, not to the contracted muscle and limb, but to the spine. This view of the case was immediately accepted. I caused

a spinal swing to be made which I applied five days later, a matter of no little difficulty, owing to the excessive incurvation of the spine in standing and its excurvation in sitting. He at once, however, expressed himself as more comfortable, and his countenance betrayed less anxiety. I also supplied him with a spinal swing and a trapeze or hand swing, having instructed him in their use in my orthopaedic gymnasium, and furnished written directions as to time and manner of exercising with them at home.

He left the city in ten days, and I soon learned from his father that the accuracy of my diagnosis was called in question by the physicians who had seen him at home and in Reading. One reason especially urged for doubting it, was that when the boy was lying on his back, he could stretch out both legs straight side by side. And this is so simple a difficulty, and yet so often proves a stumbling block, that I may be pardoned for calling your attention for a moment more particularly to its *rationale*. In making any examination involving measurements of the skeleton, contractions, joint diseases, etc., always make it a point to place the patient on a hard surface, either a table, the floor, or a very firm couch, *never a feather-bed*. Now, if the question is of hip-disease or prosar abscess, in other words, of ankylosis, fibrinous or muscular, of the hip-joint, slip one hand under the small of the back—the patient lying supine, with the limbs stretched out as straight as possible—and with the other slowly flex the sound limb. The pressure of the body upon the hand underneath it will continue absolutely unchanged. Repeat the experiment on the suspected limb, and if either of these conditions exist, you will at once begin to feel the spine pressing more heavily upon the hand, and this pressure will increase the higher the leg is lifted. This test will often convince the examiner in a case of hip-disease in its early stage, when every diagnostic point is of importance, that the free motion which he appears at first to get through the diseased joint, in reality takes place through that of the opposite side, being transmitted through the pelvis. The affected limb, therefore, lies straight beside its fellow, because the lumbar spine has yielded to the weight of the thigh, arching upwards and tilting the pelvis forwards. I corresponded both with the attending physician and with Dr. Cleaver, of Reading, giving the reasons for my opinion; and before the abscess made its way to the surface or passed outside the abdominal cavity, had the satisfaction of demonstrating its existence to them separately, at my office, on the person of the patient.

I had warned the father at the first interview, that although a *prosar* abscess was sometimes absorbed under the employment of efficient

support to the diseased spine, I could not promise any such result, and that in this instance, the pus would probably work its way down into the thigh and come to the surface in its upper third. I was not surprised, therefore, to have the boy brought down again, about the middle of November, nine months later, and to find a well-defined tense tumor of considerable size below Poupart's ligament. This I aspirated on the 29th of November, assisted by Dr. Atkinson, Passed Assistant Surgeon Siegfried, and Assistant Surgeon Boyd, U. S. N., Dr. Atkinson administering the anæsthetic. Owing to the excessive nervousness of the patient, I resorted to the expedient of putting him into a profound sleep with chloral hydrate before administering the ether, a first attempt to anæsthetize him having entirely failed. The aspiration was only partially successful owing to the shreds of necrosed tissue which continually blocked the needle, but about five ounces of unhealthy pus were removed through a wall of about an inch in thickness, and an injection of salicylic acid and iodine thrown in, in the hope of setting up a healthy action in the cavity. In this I was entirely disappointed. The pus soon began to re-accumulate and the swelling was by the end of a week larger than before. At the end of the second week the pus made its way along the track of the needle and the abscess soon discharged freely. It was dressed with a salicylic ointment, a poultice sprinkled with a salicylic lotion being occasionally used, and the whole carefully covered from the air with cotton wadding sprinkled with the same, and oil-silk smeared with salicylic oil. At the same time the Messrs. Wyeth made for me a salicylate of quinia, which he took in six-grain doses two or three times a day. The tendency of the opening to close was obviated by the use of lint tents stiffened with salicylic cerate rolled into a small cylinder and introduced to the depth of about two inches. Hectic soon set in with night sweats, entire loss of appetite and excessive despondency. As his room at the La Pierre House was dark, gloomy, and very small, overlooking a narrow court, I had him removed to a private boarding-house, where he could have the benefit of sunshine and fresh air, and homely diet, and he soon began to improve. On the fourteenth of January, a month after the spontaneous discharge of the abscess, he left for home greatly improved. Under the efficient care of Dr. Lytle, of Philipsburg, with whom I corresponded in consultation, this improvement continued with slight interruptions. During all this time he was never, *day or night*, without his spinal splint, which was the source of the greatest possible relief from pain in the back and leg. As soon as the abscess ceased to be a source of anxiety, I recommenced the systematic use of suspension, adding to his other

apparatus the wheel-crutch, which was of much service in enabling him to regain the use of his limb. The first of May he again came to the city and spent two weeks in my house, during which massage and movements of the limb were cautiously employed, but the contraction was still very great and the abscess discharging somewhat. By the 10th of June "he began to walk a little without the wheel-crutch, went out riding every day, and could sit up straight in a chair." June 20th, his father writes, "Dick can walk up and down stairs without assistance;" and September 1, "His leg has healed up, his back has grown very strong and quite straight, and he is only the least particle lame. We can hardly realize that it is the same Dick. He still uses all of his swings regularly."

He continued to improve without further interruption. His father writes, May 16, 1877, "I wish very much that you could see Dick. He is now stronger than he ever was, in perfect health; his back entirely straight; never complains of the least pain, weakness, or soreness; takes the most violent exercise, and joins in the roughest kind of play. We were always very careful to follow out your instructions to the letter and to have him use his swings regularly."

This result I consider sufficiently bears out the statement with which this paper opened, that the case possesses an intrinsic interest as indicating the value of mechanical treatment, and especially, I may add, of *suspension* in spinal affections.

1503 SPRUCE STREET, PHILADELPHIA, JUNE 11, 1877.

